

SECTOR IN-DEPTH

29 SEPTEMBER 2015

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US Water and Sewer Utilities FY 2013 Medians

US Municipal Water and Sewer Utilities Demonstrate Stable to Positive Trends

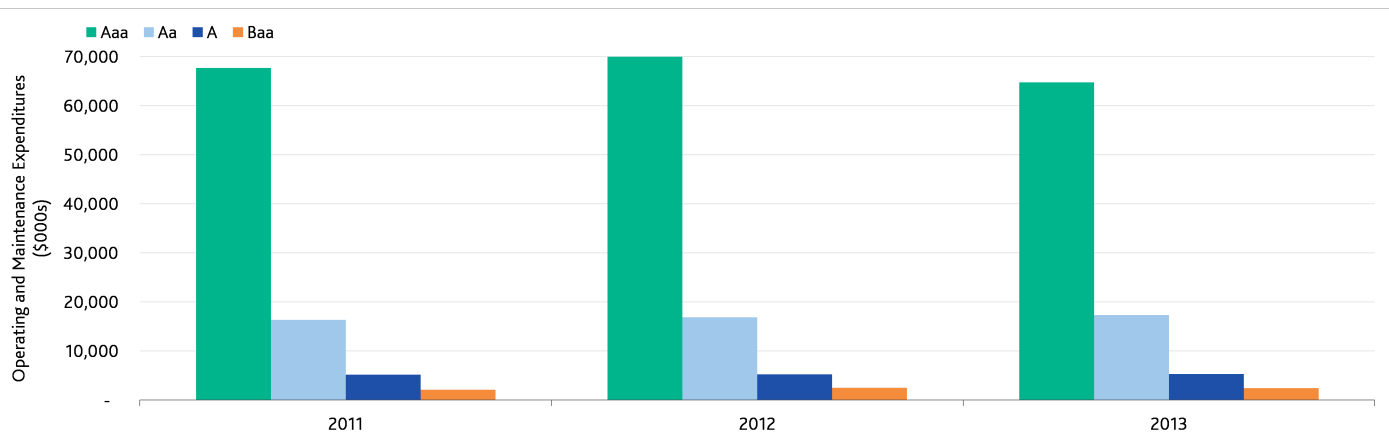
Water and sewer utilities realized overall consistent to modestly improving metrics in the three-year period through fiscal year (FY) 2013, indicating overall stability for the sector.

Going forward, this report will be published annually during the first quarter of the calendar year. We will publish medians for FY 2014 in the first quarter of 2016 to conform to the timing of financial disclosure trends for municipal utilities.

The FY 2013 US water and sewer utility medians and three-year averages highlight:

- » **Operating expenses reflect the scale advantage for larger utilities.** Large systems enjoy greater financial resources that facilitate operating flexibility, and have bigger and more diverse customer bases. Small systems are more limited and likely to face pressures from customer concentration, or rely on one source for water supply or treatment.
- » **Service area wealth correlates to stronger operating performance for higher-rated utilities.** More affluent service areas have greater capacity to bear higher service rates, which better allows utilities to support operations, debt and capital needs.
- » **Debt service coverage across the sector remains consistent.** Coverage levels for FY 2013 reflect overall stability over the last three years and sufficient margins to absorb business risks. Higher-rated utilities demonstrate significant margins of net revenues over debt service.
- » **Liquidity demonstrated continued, modest improvement.** Unrestricted cash levels improved across the sector in the three years ending FY 2013 and allow systems greater flexibility to absorb contingencies or service disruptions.
- » **Leverage declined for higher-rated utilities and grew for lower-rated utilities.** Systems with lower debt loads have greater capacity to fund critical capital needs either with additional debt or on a pay-go basis. Heavily indebted systems have greater fixed costs and are less able to make cuts or achieve high debt service coverage.
- » **Asset conditions indicate continued aging of infrastructure.** Remaining useful life of capital assets declined marginally over the three years ending FY 2013 because many systems are deferring capital investments or not investing aggressively enough in plant and equipment to overcome depreciation.

Exhibit 1

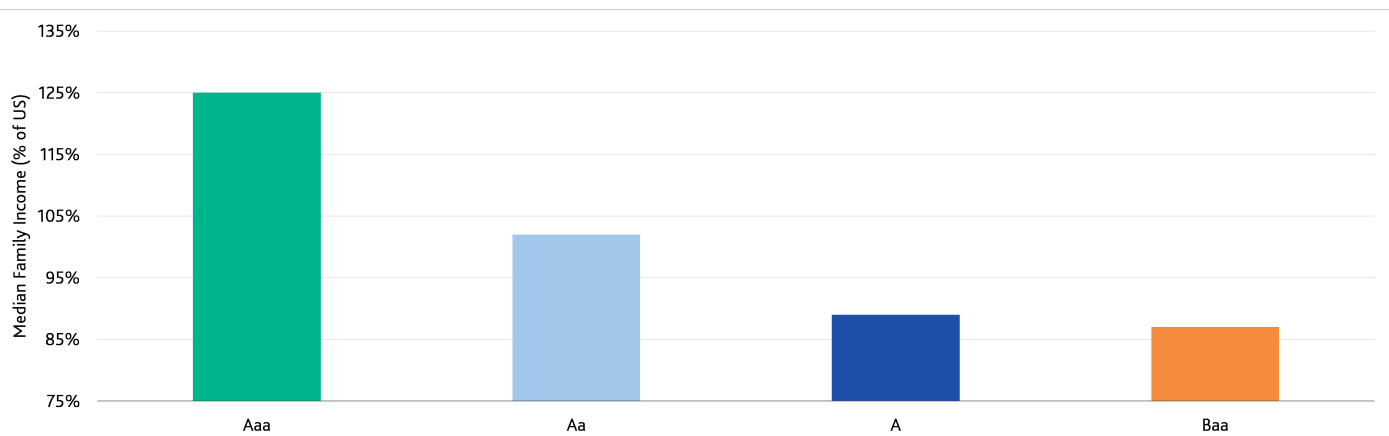
Larger Systems Have Operating Flexibility Advantages While Smaller Systems Have More Limited Resources to Absorb Unplanned Costs

Source: Moody's Investors Service

Operating expenses were overall stable across the sector for the three years ending FY 2013 (see Exhibit 1). Larger systems have greater financial resources that facilitate operating flexibility and have bigger and more diverse customer bases. Small systems have a more limited scale of resources and are more likely to face pressures from customer concentration, or have only one resource for water supply or treatment.

Another important advantage of larger systems is the relative ability to afford contingencies, like unexpected capital needs or loss of a major customer, that would burden the budgets of smaller utilities. Larger systems also tend to have redundancies allowing for continued operations while making repairs amid service disruptions.

Exhibit 2

Affluent Service Areas Have Greater Capacity to Bear Utility Rates to Support Costs

Source: Moody's Investors Service

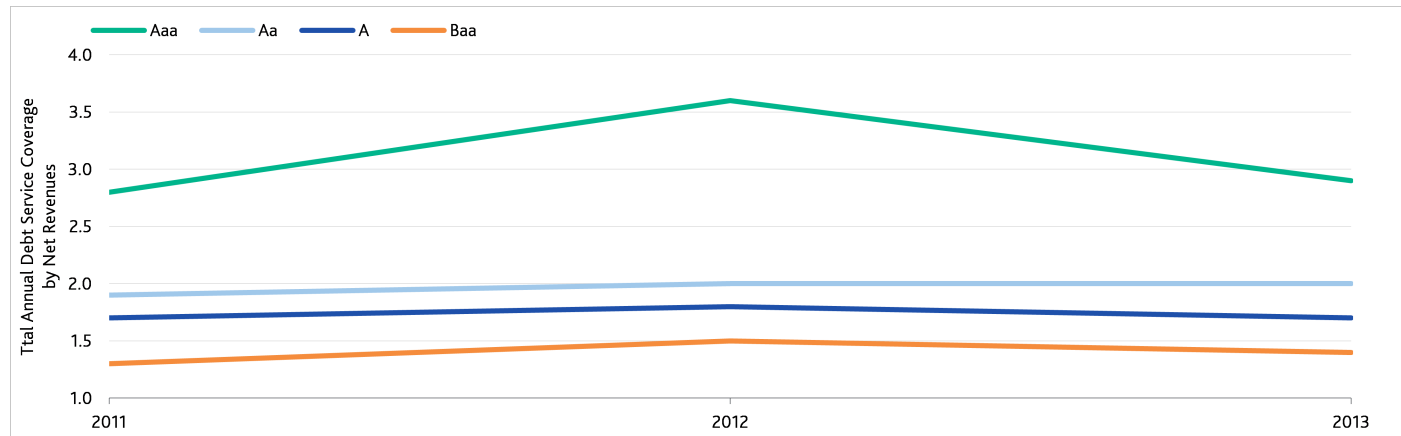
Data from the 2012 American Community Survey indicates that wealthier service areas correlate to stronger credit quality with higher-rated systems more able to invest in capital needs and generate stronger debt service coverage. Affluent service areas have greater capacity to bear higher service rates, both politically and financially, which better allows utilities to support operations, debt and capital needs (see Exhibit 2). Service charges are the primary revenues for utilities so operating and capital costs are borne by ratepayers.

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Utilities in over 40 states have unilateral rate-setting authority which provide a strong ability to tap into local wealth and raise revenues to cover operating expenses and debt service while complying with covenants.

Exhibit 3

Utilities Demonstrate Overall Consistent Debt Service Coverage

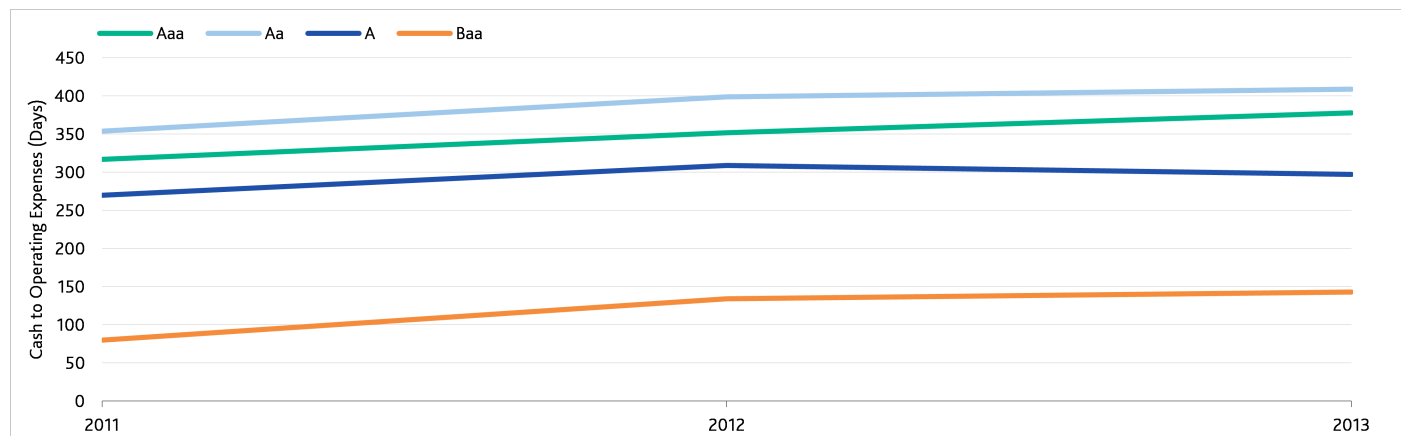


Source: Moody's Investors Service

Debt service coverage levels for FY 2013 reflect overall stability over the last three years and sufficient margins to absorb business risks (see Exhibit 3). Strength of coverage correlates to overall credit quality across the sector with higher-rated utilities having significant margins of net revenues over debt service. Higher coverage provides assurance there will be sufficient revenues for debt service while maintaining flexibility to absorb unexpected costs, revenue volatility or political opposition to service rate increases.

Exhibit 4

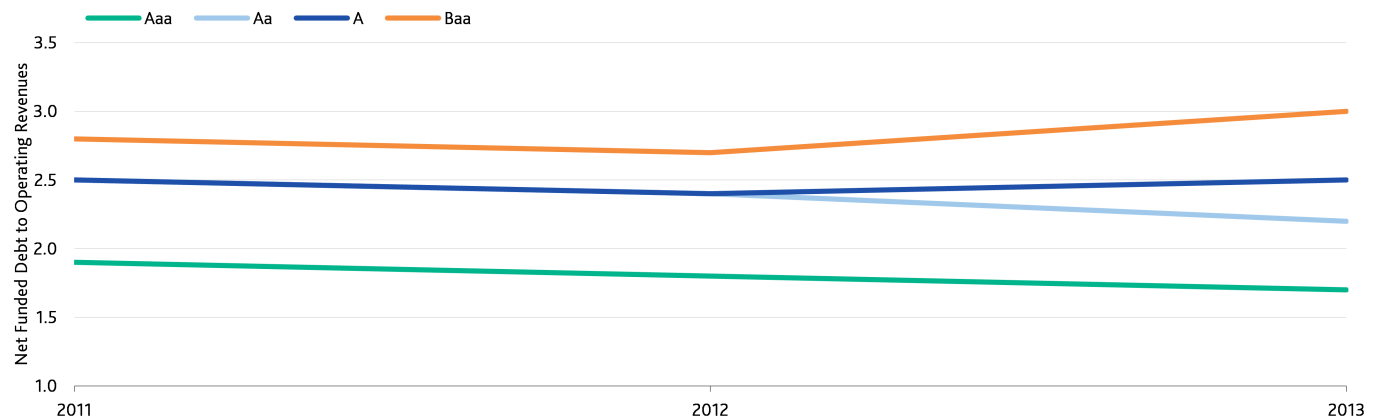
Growth in Liquidity Bolsters Ability to Weather Pressures with Limited Disruption to Debt Service and Limited Operating Impact



Source: Moody's Investors Service

Unrestricted cash available for operating expenses improved across the sector in the three years ending FY 2013 (see Exhibit 4). Stronger liquidity allows greater flexibility to absorb near-term contingencies or service disruptions while continuing to fund debt and other payments. Baa-rated utilities have substantially weaker liquidity than higher-rated peers and are more vulnerable to business risks.

Exhibit 5

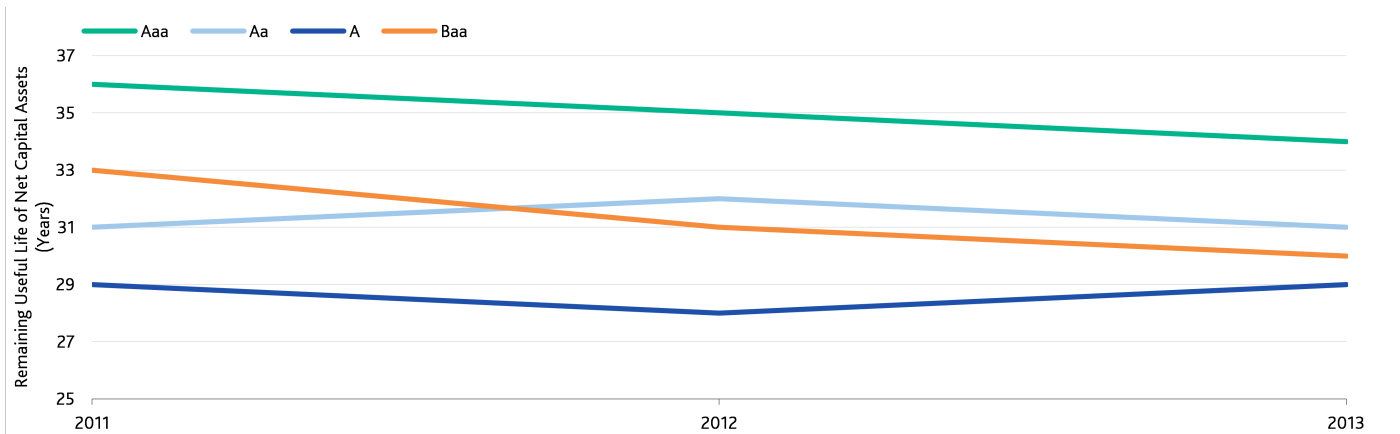
Declining Leverage for Higher-rated Utilities Bolsters Flexibility, While Lower-rated Utilities Bear Escalating Fixed Costs

Source: Moody's Investors Service

Leverage relative to operating revenues is inverse to overall credit quality with heavily indebted systems having greater fixed costs and less ability to make operating adjustments or achieve high debt service coverage (see Exhibit 5). Systems with lower debt loads have greater capacity relative to operating revenues to fund critical capital needs, either through capacity to bear additional debt or funding projects on a pay-as-you-go basis.

However, low leverage may also indicate deferrals of prudent capital investments. At the same time, high leverage may prevent a utility from financing important future capital upgrades or reflect the impact of issuing a large amount of debt for long deferred capital needs.

Exhibit 6

Many Utilities Are Not Reinvesting Aggressively Enough to Address Aging Capital Assets

Source: Moody's Investors Service

Remaining useful life of capital assets declined marginally over the three years ending FY 2013 because many systems are deferring capital investments or not investing aggressively enough in plant and equipment to overcome depreciation (see Exhibit 6). A longer-term trend of declining useful life would lead to deterioration of system assets and operating issues such as combined sewer overflows or leaking water pipes. System deterioration can lead to violations of environmental rules and even regulatory consent decrees that reflect costs of deferred capital investment.

Appendix: Key Metrics for US Water and Sewer Utilities by Sector and Rating Category

FY 2013 Publicly Rated US Water and Sewer Utility Medians - Sector

Exhibit 7

Medians for All US Water, Sewer, and Combined Utilities

Selected Indicators	2011	2012	2013	3-Year Average
Asset Condition: (Remaining Useful Life)	31	31	30	31
System Size: (O&M in 000s)	10,571	10,551	11,097	10,740
Annual Debt Service Coverage	1.9	1.9	1.9	1.9
Days Cash on Hand	318	354	371	348
Debt to Operating Revenues	2.5	2.4	2.3	2.4

Exhibit 8

Medians for US Water Utilities

Selected Indicators	2011	2012	2013	3-Year Average
Asset Condition: (Remaining Useful Life)	34	33	32	33
System Size: (O&M in 000s)	6,552	6,480	6,952	6,661
Annual Debt Service Coverage	1.8	2.0	2.0	1.9
Days Cash on Hand	281	305	334	307
Debt to Operating Revenues	2.3	2.2	2.0	2.2

Exhibit 9

Medians for US Sewer Utilities

Selected Indicators	2011	2012	2013	3-Year Average
Asset Condition: (Remaining Useful Life)	31	31	30	31
System Size: (O&M in 000s)	8,676	8,897	9,284	8,952
Annual Debt Service Coverage	1.7	1.7	1.9	1.8
Days Cash on Hand	421	451	513	462
Debt to Operating Revenues	3.0	2.9	2.9	2.9

Exhibit 10

Medians for US Combined Water and Sewer Utilities

Selected Indicators	2011	2012	2013	3-Year Average
Asset Condition: (Remaining Useful Life)	29	28	29	29
System Size: (O&M in 000s)	14,641	14,382	15,254	14,759
Annual Debt Service Coverage	1.9	1.9	1.9	1.9
Days Cash on Hand	307	345	360	337
Debt to Operating Revenues	2.5	2.3	2.2	2.3

Source: Moody's Investors Service

FY 2013 Publicly Rated US Water and Sewer Utility Medians - Rating Category

Exhibit 11

Medians for Aaa-rated US Water and Sewer Utilities

Selected Indicators	2011	2012	2013	3-Year Average
Asset Condition: (Remaining Useful Life)	36	35	34	35
System Size: (O&M in 000s)	67,746	70,565	64,785	67,699
Service Area Wealth: (2012 MFI)	125%			
Annual Debt Service Coverage	2.8	3.6	2.9	3.1
Days Cash on Hand	317	352	378	349
Debt to Operating Revenues	1.9	1.8	1.7	1.8

Exhibit 12

Medians for Aa-rated US Water and Sewer Utilities

Selected Indicators	2011	2012	2013	3-Year Average
Asset Condition: (Remaining Useful Life)	31	32	31	31
System Size: (O&M in 000s)	16,365	16,882	17,375	16,874
Service Area Wealth: (2012 MFI)	102%			
Annual Debt Service Coverage	1.9	2.0	2.0	2.0
Days Cash on Hand	354	399	409	387
Debt to Operating Revenues	2.5	2.4	2.2	2.4

Exhibit 13

Medians for A-rated US Water and Sewer Utilities

Selected Indicators	2011	2012	2013	3-Year Average
Asset Condition: (Remaining Useful Life)	29	28	29	29
System Size: (O&M in 000s)	5,166	5,274	5,324	5,255
Service Area Wealth: (2012 MFI)	89%			
Annual Debt Service Coverage	1.7	1.8	1.7	1.7
Days Cash on Hand	270	309	297	292
Debt to Operating Revenues	2.5	2.4	2.5	2.5

Exhibit 14

Medians for Baa-rated US Water and Sewer Utilities

Selected Indicators	2011	2012	2013	3-Year Average
Asset Condition: (Remaining Useful Life)	33	31	30	31
System Size: (O&M in 000s)	2,146	2,481	2,451	2,359
Service Area Wealth: (2012 MFI)	87%			
Annual Debt Service Coverage	1.3	1.5	1.4	1.4
Days Cash on Hand	80	134	143	119
Debt to Operating Revenues	2.8	2.7	3.0	2.8

Source: Moody's Investors Service

Basis for Medians

The medians report conforms to our US [Municipal Utility Revenue Debt rating methodology](#) published in December 2014. As such, the medians presented here are based on the key metrics outlined in the methodology and the associated scorecard. The appendix of this report provides additional metrics broken out by sector and rating category.

We use data from a variety of sources to calculate the medians, some of which have differing reporting schedules. Whenever possible, we calculated these medians using available data for fiscal year 2013. However, there are some exceptions such as median family income which was derived from the 2012 American Community Survey.

Medians for some rating levels, namely Aaa and Baa-rated issuers, are based on relatively small sample sizes. These medians, therefore, may be subject to potentially substantial year-over-year variation.

Our ratings reflect our forward looking opinion derived partly from forecasts of financial performance and qualitative factors, as opposed to strictly historical quantitative data used for the medians. Our expectation of future performance combined with the relative importance of certain metrics on individual local government ratings account for the range of values that can be found within each rating category.

Moody's Related Research

Rating Methodology:

- » [US Municipal Utility Revenue Debt, December 2014 \(177321\)](#)

Special Comments:

- » [Most US Sewer Utilities Can Weather Costs of Federal EPA Consent Decrees \(171695\)](#)
- » [Most US Municipal Utilities Enjoy Unlimited Authority Over Rates \(174130\)](#)

To access any of these reports, click on the entry above. Note that these references are current as of the date of publication of this report and that more recent reports may be available. All research may not be available to all clients.

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MOODY'S

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RATING METHODOLOGY US Municipal Utility Revenue Debt

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This methodology explains how Moody's evaluates the credit quality of essential service US municipal utility revenue bonds. The approach described in the methodology applies to six basic categories of municipal utilities¹: water distribution, gas distribution, electric distribution, sanitary sewerage, stormwater disposal, and solid waste disposal.

The primary factors that drive our credit analysis for these types of utilities are the size and health of the system and its service area, the financial strength of its operations, the legal provisions governing its management, and the strength of its rate management and regulatory compliance.

We intend for this methodology to help investors, municipalities, utilities, and other interested market participants understand how key quantitative and qualitative risk factors are likely to affect ratings in the municipal utility sector. This document does not offer an exhaustive treatment of all factors that are reflected in our ratings, but should enable the reader to understand the considerations that are usually most important for ratings in this sector.

This methodology updates and replaces two methodologies governing our municipal utility revenue ratings: the [Analytical Framework for Water and Sewer System Ratings](#), August 1999, and [US Public Power Electric Utilities](#), April 2008. While reflecting many of the same core principles that we have used in assigning ratings to this sector for years, this updated methodology introduces a scorecard that quantifies several factors that we previously evaluated in qualitative ways. A modest number of ratings are expected to change as a result of the implementation of this methodology.

The purpose of the scorecard is to provide a reference tool that market participants can use to approximate most credit profiles within the US municipal utility sector. The scorecard provides summarized guidance for the factors that we generally consider most important in assigning ratings to these issuers. However, the scorecard is a summary that does not include every rating consideration. The weights the scorecard shows for each factor represent an approximation of their importance for rating decisions. In addition, the scorecard was built based on historical results, while our ratings are based on forward-looking expectations. As a result, we would not expect the scorecard-indicated rating to match the actual rating in every case.

¹ The methodologies used to assign ratings to municipal utility districts, global regulated water utilities, regulated electric and gas utilities, electric generation and transmission cooperatives, and waste-to-energy projects can be found in the methodology index on moodyys.com.

Introduction

This methodology covers debt secured by the revenues generated by US municipal utilities providing monopolistic services essential to public health and functional economies.

The security for a municipal utility revenue bond is typically defined in a bond resolution or a trust indenture, which acts as a contract between the utility and its bondholders. The resolution or indenture most often identifies the bond's security as a lien on the net revenues of the system after the payment of regular operating and maintenance expenses.

The sector is varied and fragmented. US municipal utilities provide many different services whose rates or fees can secure debt. The utilities rated under this methodology mostly fall into one or more of six basic categories:

- 1) **Water utilities** take water from the ground, a river, a lake, or in special cases the ocean, treat it to a potable standard, and distribute it to customers for drinking, cleaning, and commercial, industrial, or agricultural uses. These utilities can be involved in any or all of the functions of water supply: water treatment, long-distance transmission, and retail water distribution. Some water utilities have no treatment capacity and purchase potable water wholesale.
- 2) **Gas utilities** take natural gas from a wholesale² pipeline, odorize it for safety detection, and pressurize it and deliver it to customers through a pipe network for uses such as heating, cooking, or commercial and industrial applications. Some municipal gas systems may encompass their own natural gas supplies.
- 3) **Electric utilities** purchase electricity³ from wholesale suppliers and deliver it to residential, commercial, and industrial customers for a wide range of power uses.
- 4) **Sanitary sewer** utilities collect and treat wastewater, discharging it into a waterway or injecting it underground, and landfilling or incinerating the residual sludge. Some sewer utilities with no treatment capacity gather wastewater and transmit it to another utility that treats it.
- 5) **Stormwater** utilities collect and treat rainwater before discharging it into a body of water such as an ocean or a river. While every city or county addresses stormwater drainage as an integral element of its streets and highways, the stormwater systems that require capital markets financing are typically large in scale and are necessary to avert flooding from heavy seasonal rainfall in hilly areas.
- 6) **Solid waste** utilities collect residential or commercial refuse and dispose of it through landfills, waste-to-energy plants, or other waste-disposal processes. A solid waste system can be complete or collection-only, relying on another municipal or private entity for long-haul removal and disposal through landfill or incineration.

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² This methodology covers gas distribution utilities. These utilities purchase their supply from providers covered under the [Regulated Electric and Gas Utilities](#) methodology, or other providers.

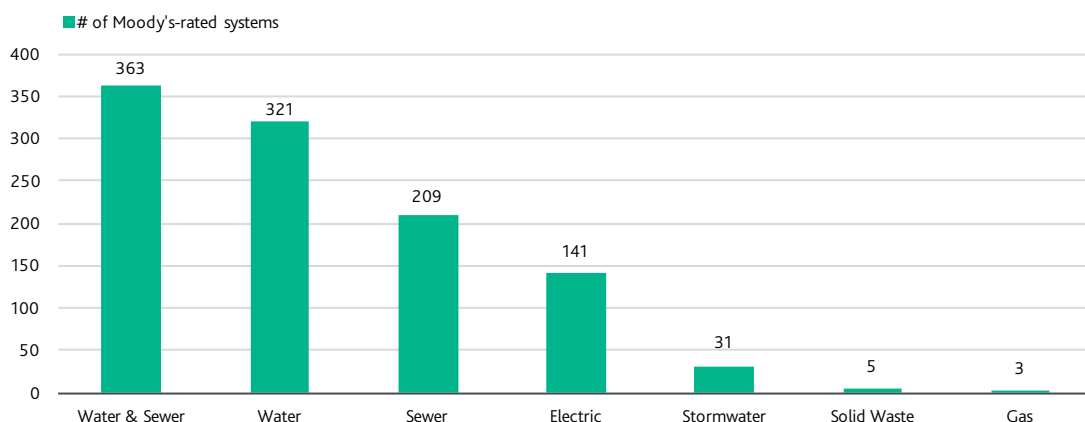
³ Only those municipal electric utilities that generate less than 20% of their own power are covered by this methodology. For more information on how we rate electric generation utilities, see [US Public Power Electric Utilities with Generation Ownership Exposure](#) and [US Municipal Joint Action Agencies](#).

Defining the municipal utility universe

This methodology covers essential-service utilities that operate as departments, boards, or independent authorities of US states or local governments. We rate approximately 1,100 utilities in this category (see Exhibit 1). More than 80% of these utilities are water and/or sewer systems. Many of these are distribution or collection systems with no treatment capacity of their own.

EXHIBIT 1

Municipal Utility System Overview



Source: Moody's Investors Service

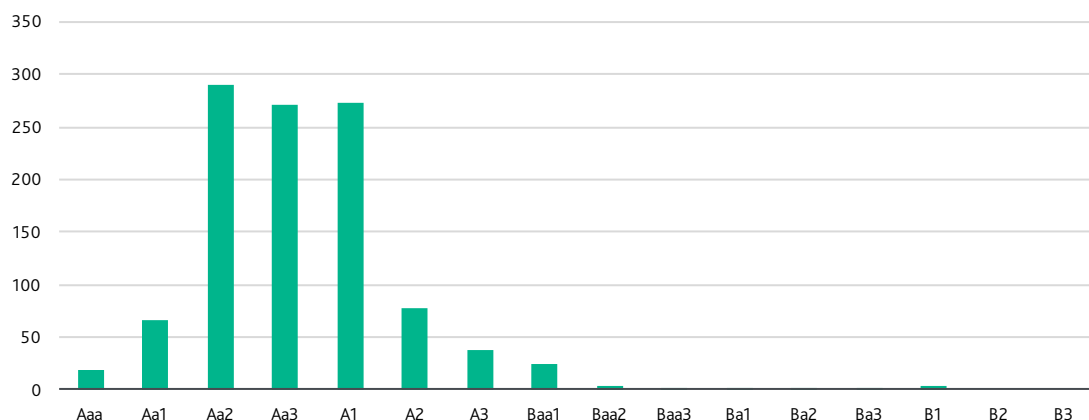
States and subdivisions of states, such as counties and cities, often issue bonds secured by the net revenues generated by a system operated directly under their auspices, such as a city water department. Other times, states or state subdivisions create an independent authority or special purpose district that operates the system and issues the bonds. This distinction is usually unimportant for rating purposes, although in some cases a separate authority has beneficial management expertise.

This methodology focuses on revenue bonds for essential-service functions. Other types of public utilities issue bonds backed by revenues charged for services such as telephone, cable television, or parking. These services are typically competitive and subject to greater elasticity in pricing and utilization. Bonds secured by revenues generated by these services are not rated under this methodology. Also not rated under this methodology are utility revenue bonds whose rating is ultimately [based on a General Obligation guaranty](#). Lastly, the electric utilities covered under this methodology are retail distributors of electricity mostly generated elsewhere. Electric generation utilities, municipal waste-to-energy facilities, and US municipal joint action agencies are rated under separate methodologies.

The credit quality of essential-service utility revenue bonds is generally quite strong. The median rating for this sector is Aa3 (see Exhibit 2), and with very few exceptions these bonds have strong investment grade ratings. More than 85% of essential-service revenue bonds are rated A1 or higher. Four of the eight municipal utilities with speculative-grade ratings as of publication are affiliated with a local government in Chapter 9 bankruptcy⁴ (see “The Relationship Between General Obligation and Revenue Bond Ratings” below).

⁴ These are: the Detroit Water Enterprise, the Stockton Water Enterprise, the Detroit Sewer Enterprise, and the Stockton Sewer Enterprise

EXHIBIT 2

Municipal Utility Rating Distribution

Source: Moody's Investors Service

The generally high ratings of the sector are a testament to numerous fundamental strengths, including:

- 1) The provision of essential services, usually in a government-protected monopoly
- 2) Typically unregulated and independent rate-setting authority
- 3) The ability to discontinue service to delinquent accounts and in many cases to put a lien on the property for nonpayment
- 4) Utility cost burdens that are typically low relative to household income and to tax burdens
- 5) A generally strong federal and state regulatory framework that is designed to keep utilities functioning in order to protect public health and achieve environmental goals
- 6) A "special revenue" designation that may insulate a utility from a parent's bankruptcy

A sparse history of default, bankruptcy, and serious financial distress helps to underpin the high ratings in this sector. Since 1970, only four Moody's-rated essential-service utility systems have [defaulted](#)⁵.

EXHIBIT 3

Rated Municipal Utility Defaults Since 1970⁶

Default	Type of System	Year of default	Recovery
Washington Public Power Supply System	Electric Generation	1983	40%
Vanceburg, KY	Electric Generation	1987	100%
Jefferson County, AL	Sewer	2008	54%
Oakdale, CA	Water and sewer	2012	94%

Source: Moody's Investors Service

⁵ The Harrisburg Authority, PA's Resource Recovery Facility bonds [defaulted](#) in 2009. We did not rate these as revenue bonds, but as General Obligation (GO) bonds backed by the City of Harrisburg's GO pledge. Similarly, a [City of Menasha](#), WI default on a steam plant project was rated as a GO credit and not as a municipal utility. Detroit's water and sewer bonds have not defaulted, though as of this writing the city's Chapter 9 bankruptcy exit is still pending.

⁶ As electric generation utilities, the Washington Public Power Supply System and Vanceburg electric revenue bonds would not have been rated under the current methodology.

We see each of these default situations as unusual and idiosyncratic, with limited relevance to the sector as a whole. We expect the very low rate of default in the sector to continue. For more information, see [US Municipal Bond Defaults and Recoveries, 1970-2013](#).

The Relationship Between General Obligation (GO) and Utility Revenue Bond Ratings

A municipality's GO credit quality may directly affect the strength of its associated utility systems. This section outlines the broad principles that apply when assessing the credit linkages between a municipality's GO and utility debt. These broad principles are meant to enhance transparency around our view of the relationship between related ratings and explain why, in most cases, the ratings of GO and associated utility revenue debt are and will remain relatively close.

Municipal utility debt is generally exposed to similar credit strengths and pressures as the GO and can thus expect to experience simultaneous credit improvement or deterioration. Examples of credit linkages between the GO and utility debt include:

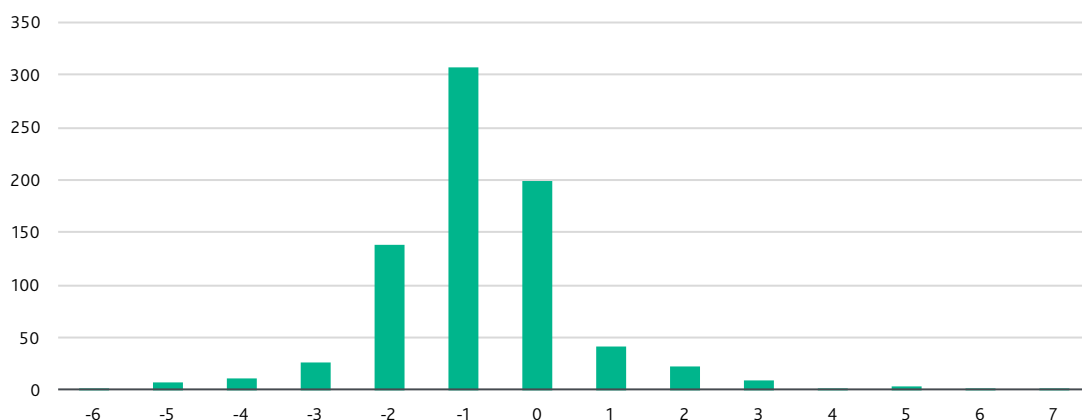
- » Economy: Utility systems usually rely on a coterminous or overlapping economic base and service area.
- » Legal structure: Utility bond indentures sometimes contain events of default tied to the bankruptcy or insolvency of the general government.
- » Finances and Debt: Cash can often flow between the two entities, sometimes with a formal funding mechanism. Debt and other long-term liabilities are often paid by the same group of constituents. GO and utility issuers may also be exposed to the same pension plan.
- » Management and Governance: Management of the city and the utility may be the same or have close ties. For instance, city management may appoint the board of the utility or have the power to affect enterprise rates.
- » Capital Markets: The GO and the utility issuer may need to access the same capital markets for funding.

Because of these linkages, in most cases, ratings of a municipality's utility debt will be within two notches of its GO rating. Our current rating distribution highlights this relationship, with few utility ratings departing from their respective GO ratings by more than two notches (see Exhibit 4).

EXHIBIT 4

Relationship Between Municipal Utility and General Government GO Ratings

(Negative means utility rating is lower than the GO, positive means it is higher; not all rated utilities are associated with rated general governments)



Source: Moody's Investors Service

There are, however, cases where a utility's credit strength may be sufficiently independent from its associated GO rating to justify a larger notching difference. We expect these cases to be rare, and they would likely include several of the following characteristics:

- » An unusually weak GO rating which is driven by idiosyncratic factors less relevant to the utility's credit strength.
- » A non-coterminous service area, so that utility revenues are derived from a larger and more diversified base.
- » A closed loop flow of funds, wherein the GO issuer is unable to access utility revenues.
- » A strict separation of accounts and assets.
- » The absence of rating triggers tied to the GO credit quality in utility financings.
- » Separation of management and governance.

An example of a utility rated more than two notches above its parent government is the Detroit Water and Sewer Department, which benefits from a much larger and more diverse service area than the city of Detroit, has separate accounts, and has a bond indenture that precludes distributions of excess cash flow to the city's general fund.

Conversely, a utility rating more than two notches below its associated GO generally has one or more of the following characteristics:

- » An unusually weak utility rating which is driven by factors less relevant to the general government's credit strength.
- » A utility service area that is narrower and less diverse than the municipality as a whole
- » A lack of expectation that the general government would transfer funds to assist a utility experiencing financial distress.
- » A strict separation of accounts and assets.
- » The absence of rating triggers tied to the utility credit quality in GO financings.

» Separation of management and governance.

An example of a utility revenue bond rated more than two notches below the parent's GO is the [St. George Electric Enterprise](#), UT (Baa1 negative). While the [City of St. George](#) (Aa3) holds healthy reserves and has demonstrated steady operating performance, the electric distribution system has exhibited an unwillingness to raise electric rates fast enough to keep up with rising power supply costs. The electric system maintains narrow liquidity and has failed to generate enough net revenues to cover debt service in multiple years, justifying a significantly lower revenue rating than the related GO. We did, however, [downgrade the city](#) from Aa2 in 2013 partially because of the relationship to the utility funds, illustrating that these relationships are important even in cases when a wider disparity between GO and utility ratings is warranted.

Essential service revenue bonds in bankruptcy

An important property of public utility revenue bonds is that they enjoy a potential moat from a general government's bankruptcy. Under Chapter 9 of the US bankruptcy code, a lien on "special revenue" bonds remains valid and enforceable even if the issuer is granted bankruptcy protection.

The potential survival through bankruptcy of a lien on the net revenues of a utility system is a key strength. When a debtor is granted bankruptcy protection, its unsecured assets are subject to an automatic stay, which freezes outflows unless approved by the bankruptcy judge. An asset secured by a lien that is not subject to the automatic stay enjoys a credit advantage over a related General Obligation credit that is subject to the stay.

Further, a special revenue bond is less susceptible to adjustment in bankruptcy if its lien leads to an interpretation of the bonds as enjoying secured status.

Although the bankruptcy code establishes these strengths of a special revenue bond, Chapter 9 remains largely untested. Case law offers few precedents, and only a handful of examples to support the assertion that a special revenue designation protects revenue bonds in bankruptcy.

The political reality is that utility systems are often major cash-generating assets that other stakeholders frequently would like to bring into bankruptcy negotiations. Moreover, bankruptcy judges in some cases have allowed the cash flows generated by special revenue systems to pay the legal costs of related parents in bankruptcy.

It is premature to conclude that utility revenue bonds are completely insulated from Chapter 9 bankruptcies, and the risks and costs of a general government bankruptcy remain considerable.

For more information, please refer to our Special Comment, [Key Credit Considerations for Municipal Governments in Bankruptcy](#).

The Scorecard

The municipal utility scorecard (see Exhibit 5) is a tool providing a composite score of a utility's credit profile based on the weighted factors we consider most important, universal and measurable, as well as possible notching factors dependent on individual credit strengths and weaknesses. The scorecard is designed to enhance the transparency of our approach by identifying critical factors as a starting point for analysis, along with additional considerations that may affect the final rating assignment.

The scorecard is not a calculator. Its purpose is not to determine the final rating, but rather to provide a standard platform from which to begin viewing and comparing municipal utility credits. It therefore acts as a starting point for a more thorough and detailed analysis.

The scorecard-indicated rating will not match the actual rating in every case, for a number of reasons including the following:

- » Our methodology considers forward-looking expectations that may not be captured in historical data.
- » The scorecard is a summary that does not include every rating consideration.
- » In some circumstances, the importance of one factor may escalate and transcend its prescribed weight in this methodology.

EXHIBIT 5

Municipal Utility Scorecard Factors

Broad Scorecard Factors	Factor Weighting	Scorecard Subfactor	Subfactor Weighting
System Characteristics	30%	Asset Condition (Remaining Useful Life)	10%
		Service Area Wealth (Median Family Income)	12.5%
		System Size (O&M)	7.5%
Financial Strength	40%	Annual Debt Service Coverage	15%
		Days Cash on Hand	15%
		Debt to Operating Revenues	10%
Management	20%	Rate Management	10%
		Regulatory Compliance and Capital Planning	10%
Legal Provisions	10%	Rate Covenant	5%
		Debt Service Reserve Requirement	5%
Total	100%	Total	100%

We intentionally limited our scorecard metrics to major rating drivers that are common to most issuers. Outside of these drivers, we may adjust the grid score for a variety of “below-the-line” adjustments, which are more idiosyncratic factors that are likely not to apply to all issuers, but that can impact credit strength. The scorecard score is the result of the “above-the-line” score based quantitatively on the above-the-line factors, combined with any “below-the-line” notching adjustments. The scorecard score is a guideline for discussion, but does not determine the final rating. The rating is determined by a committee, which considers, but is not bound by, the scorecard score.

Discussion of Key Scorecard Factors

To arrive at a scorecard-indicated rating, we begin by assigning a score for each subfactor. We've chosen measures that act as proxies for a variety of different service area characteristics, financial conditions, and governance behaviors that can otherwise be difficult to measure objectively and consistently. Based on the scores and weights for each subfactor, a preliminary score is produced that translates to a given rating level.

We may then move the score up or down a certain number of rating notches based on additional "below-the-line" factors that we believe impact a particular utility's credit quality in ways not captured by the statistical portion of the scorecard. This is where analytical judgment comes into play. We may also choose to make adjustments to the historical inputs to reflect our forward-looking views of how these statistics may change.

The scorecard score, combined with below-the-line notching, then provides an adjusted score. This adjusted score is not necessarily the final rating. Because some utilities' credit profiles are idiosyncratic, one factor, regardless of its scorecard weight, can overwhelm other factors, and other considerations may prompt us to consider final ratings that differ from the scorecard-indicated rating.

Below, we discuss each factor and subfactor, as well as the below-the-line adjustments and other considerations we analyze within each category of the methodology.

Factor 1: System Characteristics (30%)

EXHIBIT 6

System Characteristics (30%)

		Aaa	Aa	A	Baa	Ba	B and Below
Asset Condition (10%)	Net Fixed Assets/Annual Depreciation :	> 75 years	75 years ≥ n > 25 years	25 years ≥ n > 12 years	12 years ≥ n > 9 years	9 Years ≥ n > 6 Years	≤ 6 Years
System Size (7.5%)	Water and/or sewer / Solid Waste:	O&M > \$65M	\$65M ≥ O&M > \$30M	\$30M ≥ O&M > \$10M	\$10M ≥ O&M > \$3M	\$3M ≥ O&M > \$1M	O&M ≤ \$1M
	Stormwater:	O&M > \$30M	\$30M ≥ O&M > \$15M	\$15M ≥ O&M > \$8M	\$8M ≥ O&M > \$2M	\$2M ≥ O&M > \$750K	O&M ≤ \$750K
	Gas or Electric:	O&M > \$100M	\$100M ≥ O&M > \$50M	\$50M ≥ O&M > \$20M	\$20M ≥ O&M > \$8M	\$8M ≥ O&M > \$3M	O&M ≤ \$3M
Service Area Wealth (12.5%)		> 150% of US median	150% ≥ US median > 90%	90% ≥ US median > 75%	75% ≥ US median > 50%	50% ≥ US median > 40%	≤ 40% of US median

Why it matters

This factor on the scorecard measures a utility's capacity to fund its operations and capital needs based on the health of its capital assets, the size and diversity of its operations, and the strength and resources of its service base.

The scope of this factor is broad. Each of the subfactors contributes to an analysis of what magnitude of expenditures is necessary to keep the system functioning, and how large, diverse, and flexible are the resources available to meet those expenditures.

Subfactor 1a: Asset condition (10%)

Input: Net fixed assets divided by most recent year's depreciation, expressed in years

The condition of a utility's capital assets determines its ability to comply with environmental regulations and continue delivering adequate service with existing resources.

Depreciation is an accounting concept that acts as a proxy for the rate at which a utility's plant and equipment are aging. Central to our analysis of capital adequacy is an assessment of how utilities "fund depreciation," meaning make capital replacements and repairs to address aging plant and equipment.

The consequences of failing to fund depreciation can be costly. Implicit in this measure is the concept of deferred capital investment. Utilities that delay investing in their systems, replacing aging plant and equipment, and modernizing their facilities often find it more expensive to do so later. Capital investments are ordinarily more expensive when deferred.

Further, systems whose facilities deteriorate often run afoul of environmental regulations. The failure to fund depreciation, which will manifest as a declining useful remaining life, can lead to sewage overflows, inflow and infiltration problems, or non-compliant wastewater discharges, resulting in civil fines, litigation, or regulatory consent decrees. These are usually more expensive than funding depreciation through a prudent multi-year capital plan that replaces assets as they deteriorate or break down.

The inherent differences between types of utilities are manifested in their component parts, which can have very different useful lives. Because a solid waste utility is largely automotive-based, with collection vehicles and earthmoving equipment at the landfill, the useful life of its assets will be well under 20 years, compared to a water utility whose distribution mains and reservoir have useful lives of 40 to 100 years. We generally acknowledge and address these differences below the line.

For utilities whose asset condition ratios are not determinable, such as utilities that utilize cash accounting and do not report net fixed assets or depreciation, we are likely to assess the sufficiency of capital assets based on other available information.

Subfactor 1b: Service area wealth (12.5%)

Input: Median family income of the service area, expressed as a percentage of the US median

Most of the costs of operating a utility and maintaining its capital assets are borne by ratepayers. The income of the residents of the service base conveys the capacity of its ratepayers to bear higher rates to fund operations and capital upgrades. The median family income breakpoints in this scorecard are aligned with the ones in our [US Local Government General Obligation Debt](#) methodology.

Utilities that serve lower-income ratepayers may have more difficulty implementing higher rates, if utility costs consume a considerable share of residents' budgets. The US Environmental Protection Agency (EPA) considers wastewater costs exceeding 2% of median household income to be a heavy burden, for example, a threshold that would be reached more quickly for a utility serving lower-income ratepayers.

We believe MFI is the best proxy for the wealth of a service base, but other indicators such as the poverty rate, unemployment, home foreclosures, per capita income, and median home value supplement our analysis of ratepayer capacity.

Subfactor 1c: System size (7.5%)

Input: Most recent year operations and maintenance expenditures, expressed in dollars

Larger systems tend to be more diverse and enjoy economies of scale. The size of a system implies the flexibility and resilience not only of its operations, but of its service base.

Small systems present a number of risks. They are less likely to have redundancies, which allow a system to shut down some of its operations in an emergency or to make repairs without interrupting service. Small standalone water or sewer systems will typically depend upon a single supply of water or a single sewage treatment plant. They are more likely to be exposed to a concentrated customer base. They are more susceptible to the departure of a single large customer. An unexpected capital need is likely to be more costly relative to its annual budget. The collective engineering and scientific expertise is likely to be less robust than a larger system's.

We use different breakpoints for different types of systems in this subfactor, recognizing that not all types of utilities have the same cost structure. For instance, an electric distribution system is more expensive to run than a stormwater system. A distribution-only water system is likely to have a lower, more predictable cost base, but also depend on an external system for water supply and pay prices largely out of its control.

Utilities that are wholesalers to municipal government customers may exhibit operating stability not captured by size or service area wealth. Many of a utility's risks may be shifted to its municipal customers if their service contracts prevent these customers from switching providers or decreasing payments. If service contracts are so strongly worded and unconditional that municipal customers would have to pay the utility's debt service under any circumstances, then the utility's bonds may effectively represent a claim on the combined credit quality of the municipal governments.

For utilities that are exclusively wholesalers to municipal customers, we assess the customers' ("participants") credit quality, using our methodologies for [general obligation bonds](#), [lease revenue bonds](#), or other appropriate methodology determined by the nature of the participants' pledge to the utility. For bonds secured by a utility's net revenue pledge, we incorporate the strength of the municipal customers' credit quality as an important factor in the utility's revenue base. For utilities whose pledges are essentially a pass-through of the municipal customers' underlying pledges, we may rate their bonds using the [Public Sector Pool Financings](#) methodology, recognizing that bondholders enjoy a direct claim on the underlying municipalities' ability and willingness to pay.

Below-the-line adjustments

Additional service area economic strength or diversity: We would use this adjustment, up or down, if the MFI statistic incompletely or inaccurately depicts that capacity of the service base to bear higher rates.

Significant customer concentration: A large exposure to a single user or industry, or a small number of users, poses substantial risks that might not be captured in MFI. We may adjust the scorecard rating down if a large share of a utility's revenues comes from one or a small number of customers, or from a single industry. We would be more likely to use this adjustment for volatile, unpredictable, and mobile industries than for longer-standing, more stable ones. We are less likely to consider a wholesale customer as a factor contributing to concentration, as it is purchasing on behalf of end-users.

Revenue per customer greatly over/under regional average: Revenue per customer conveys additional information about users' capacity for higher rates that might not be captured in MFI. We might adjust the above-the-line rating, up or down, if revenue per customer implies higher or lower ability to increase rates than MFI suggests.

Exposure to weather volatility, extreme conditions or market fluctuations: Large amounts of rain that infiltrate pipes or storms that destroy equipment are examples of credit risks that could result in below-the-line adjustments. Weather can also affect the prices that distribution systems pay third-party providers for electricity or natural gas.

Resource vulnerability: Water, gas, and electric distribution utilities sell a product whose availability can be limited or expensive in some cases. For instance, a water provider in a [drought-stricken region](#) may have to purchase expensive third-party water, and see declines in billable flow due to conservation efforts. We may adjust the scorecard rating down if the availability of water, an adequate gas supply, or a dependable source of electricity is vulnerable or in doubt.

Sizeable or insufficient capacity margin: Our useful remaining life calculation is designed to assess the quality of existing capital assets, but it does not measure the adequacy of a system's capacity relative to demand. Areas that are growing need more water, gas, and electricity, and place greater demands on wastewater and trash disposal utilities. Systems that are close to capacity may face greater capital costs to expand in the future, suggesting larger debt burdens and posing additional risks that we may adjust the scorecard downward for. Alternately, systems with ample capacity may be notched up, given the lack of capital spending requirements implied by the excess capacity. Further, excess capacity can sometimes imply a revenue-generating opportunity, since utilities can often sell their product or service to other parties. We are less likely to view excess capacity as a positive if it is caused by a declining user base.

Unusual depreciation practices relative to industry norms: Utilities typically have some flexibility to determine the depreciation schedules of their assets. Utilizing unreasonably long useful lives or employing other practices that distort depreciation schedules would also distort our remaining useful life calculation. We may notch a score down if an unreasonable depreciation schedule is inflating a utility's remaining useful life. Likewise, we may notch a score up if an unusually rapid depreciation schedule understates remaining useful life.

Factor 2: Financial Strength (40%)

EXHIBIT 7

Financial Strength (40%)	Aaa	Aa	A	Baa	Ba	B and Below
Annual Debt Service Coverage (15%)	> 2.00x	2.00x ≥ n > 1.70x	1.70x ≥ n > 1.25x	1.25x ≥ n > 1.00x	1.00x ≥ n > 0.70x	≤ 0.70x
Days Cash on Hand (15%)	> 250 Days	250 Days ≥ n > 150 Days	150 Days ≥ n > 35 Days	35 Days ≥ n > 15 Days	15 Days ≥ n > 7 Days	≤ 7 Days
Debt to Operating Revenues (10%)	< 2.00x	2.00x < n ≤ 4.00x	4.00x < n ≤ 7.00x	7.00x < n ≤ 8.00x	8.00x < n ≤ 9.00x	≥ 9.00x

Why it matters

The financial health of a utility determines its flexibility to respond to contingencies, its resilience against potential short-term shocks, and its cushion against a long-term unfavorable trend.

We measure utilities' financial health by looking at cash and other liquid reserves, the burden that debt places on operations, and the magnitude by which revenues are sufficient to meet expenditures.

Subfactor 2a: Annual debt service coverage (15%)

Input: Most recent year's net revenues divided by most recent year's debt service, expressed as a multiple

Debt service coverage is a core statistic assessing the financial health of a utility revenue system. The magnitude by which net revenues are sufficient to cover debt service shows a utility's margin to tolerate business risks or declines in demand while still assuring repayment of debt. Higher coverage levels indicate greater flexibility to withstand volatile revenues, unexpected outflows, or customer resistance to higher rates.

Utilities usually enter into a rate covenant under which they pledge to achieve a given level of debt service coverage each year. The covenant ensures that the utility utilizes its assets to generate sufficient income to pay bondholders.

The analysis of a utility system's debt service coverage demands ample context. If debt service escalates in future years, then the utility's current net revenues may be sufficient to cover debt service this year, but not in the future. Systems with greater revenue stability can operate comfortably at lower coverage levels. Systems with greater capital needs are likely to incur more debt, which will lead to increased debt service and decreased coverage. The debt service coverage calculation is the basis for a comprehensive analysis of a utility's financial flexibility and trend over the long term.

Rate covenants define a calculation method. These calculation methods vary, for example in the inclusion or exclusion of connection fees. Our coverage calculation will frequently differ from the coverage utilities report for purposes of complying with their rate covenants. Frequently, our analysis will consider several types of coverage, including maximum annual debt service (MADS) coverage, annual debt service coverage, coverage with and without connection fees, and coverage as calculated for the rate covenant. For entry on the scorecard, we include connection fees (when pledged) in revenues, recognizing that these are pledged revenues that are usually generated annually and are an important source of funding for expansion. If connection fees are particularly volatile, or if they represent an inordinate share of revenues, we may adjust below the line.

Subfactor 2b: Days cash on hand (15%)

Input: Unrestricted cash and liquid investments times 365 divided by operating and maintenance expenses, expressed in days

Cash is the paramount resource utilities have to meet expenses, cope with emergencies, and navigate business interruptions. Utilities with a lot of cash and cash equivalents are able to survive temporary disruptions and cash flow shortfalls without missing important payments. A large cash balance can also partially compensate for the lack of a debt service reserve fund. A low cash balance indicates poor flexibility to manage contingencies.

We include in this measure any cash or cash-equivalent that is both unrestricted and liquid. The measure does not include cash held in a debt service reserve fund, unspent bond proceeds, or cash that is restricted for capital.

Subfactor 2c: Debt to operating revenues (10%)

Input: Net debt divided by most recent year's operating revenues, expressed as a multiple

A utility's debt profile determines its leverage and fixed costs. Systems that carry a lot of debt have less ability to reduce costs if demand shrinks, and are generally more challenged to achieve higher debt service coverage.

A greater debt burden may also prohibit a utility from funding necessary capital upgrades, if a covenant prevents the issuer from incurring the debt necessary to fund those upgrades.

"Net debt" is a utility's long-term debt subtracted by debt service reserve funds.

Below-the-line adjustments

Debt service coverage (annual or MADS) below key thresholds: A debt service coverage ratio below 1 times is an important threshold, because coverage below 1 times indicates the utility is not fully covering debt service with income generated from operations. If a utility fails to achieve 1 times coverage, we may adjust the score down to reflect the financial imbalance of the utility's operations. Another key threshold that would likely prompt us to adjust the score down is if coverage were to fall below the utility's coverage covenant, even if that covenant is higher than 1 times. Management's willingness and ability to operate the system for bondholders' benefit is a crucial credit consideration, and a breach of covenant calls that willingness and ability into question. A coverage level that impedes the issuance of additional bonds under the utility's additional bonds covenant could also prompt us to adjust the score down, if we think it would prevent the utility from funding necessary capital upgrades.

Constrained liquidity position due to oversized transfers: It is [common for utilities to transfer cash](#) to their general governments regularly, either to share overhead costs, make payments in lieu of taxes for occupied property, or to help fund shared infrastructure. It is also common for parent governments to tap utilities' cash to fund General Fund operations. We may notch a utility's score down if these types of transfers are large and begin to strain its own liquidity. We are more likely to make this adjustment if the general government is operationally reliant on utility transfers and has the authority to increase them, particularly if the general government is struggling financially. Even if a utility has never transferred cash to its parent, such transfers remain a possibility⁷, one of the reasons for the relationship between a revenue rating and the GO rating of its general government.

Outsized capital needs: A utility with significant capital needs will likely need to incur additional debt not communicated in the existing debt metric. We may adjust the score downward for utilities under regulatory consent decree, or otherwise with great capital needs, that are likely to increase their debt levels.

Oversized adjusted net pension liability relative to debt, or significant actuarial required contribution underpayment: Employees of public utilities are usually members of a municipal pension plan. Most utilities either sponsor their own plan or participate in another entity's plan, and are responsible for funding their share of the plan's pension liabilities. We may adjust the score down if this liability is especially large, or if the utility has underfunded its contributions.

Significant exposure to puttable debt and/or swaps, or other unusual debt structure: The risks of a debt portfolio can be magnified if it is significantly composed of puttable debt. Utilities generally set rates with the intention of covering operating expenses and debt service in the current year. A debt put, accelerated amortization under a term-out, or other unexpected calls on a utility's resources can impose

⁷ Unless the utility's flow of funds is closed-loop. A closed-loop flow of funds is stronger than an open one for this reason.

immediate and substantial, unbudgeted cash outflows and upend that intention. We may notch a score down, potentially by several notches, if the composition of a debt portfolio, or cash-flow demands or unfavorable valuation of a swap, communicates a greater degree of risk than the existing debt metric. The lesson of Jefferson County, Alabama, which [defaulted](#) on puttable sewer warrants in 2008 when they were tendered to their liquidity banks, applies here.

Factor 3: Management (20%)

EXHIBIT 8

Management (20%)	Aaa	Aa	A	Baa	Ba	B and Below
Rate Management (10%)	Excellent rate-setting record; no material political, practical, or regulatory limits on rate increases	Strong rate-setting record; little political, practical, or regulatory limits on rate increases	Average rate-setting record; some political, practical, or regulatory limits on rate increases	Adequate rate-setting record; political, practical, or regulatory impediments place material limits on rate increases	Below average rate-setting record; political, practical, or regulatory impediments place substantial limits on rate increases	Record of insufficiently adjusting rates; political, practical, or regulatory obstacles prevent implementation of necessary rate increases
Regulatory compliance and capital planning (10%)	Fully compliant OR proactively addressing compliance issues; Maintains sophisticated and manageable Capital Improvement Plan that addresses more than a 10-year period	Actively addressing minor compliance issues; Maintains comprehensive and manageable 10-year Capital Improvement Plan	Moderate violations with adopted plan to address issues; Maintains manageable 5-year Capital Improvement Plan	Significant compliance violations with limited solutions adopted; Maintains single year Capital Improvement Plan	Not fully addressing compliance issues; Limited or weak capital planning	Not addressing compliance issues; No capital planning

Why it matters

If the legal provisions establish the minimum level of financial margin at which a utility must be run, the utility's management determines the actual level at which it is run.

Utility management refers to the dynamics of setting rates, planning for capital spending, budgeting for annual expenditures, and complying with environmental regulations. All of these factors interplay with one another to determine the credit strength of a utility system.

The scorecard captures two crucial aspects of management: rate-setting and capital planning. These two aspects encompass most of what is important in running a utility: keeping the system in good working order, and paying for it.

Subfactor 3a: Rate management (10%)

User rates are the primary, and sometimes only, mechanism utilities employ to pay for their operations.

Ideally, rates increase marginally and steadily, rather than choppily. It is common for utilities to split their rates into a “base” charge (flat rate charged to all users) plus a “volumetric” charge (per unit costs based on flow/usage). Utilities funded to a greater extent by the volumetric charge face greater risks, since volume can be economically sensitive or decline because of a shift in consumption patterns.

Management's track record at setting rates appropriately and increasing them when necessary drives this score. We tend to give higher scores to utilities that set rate structures under which increases are automatic, and do not require annual approval for implementation.

Embedded into this factor is the length of time required to implement a rate increase. Many public utilities enjoy the [authority to set their own rates](#), and can enact a rate increase in short order by majority vote of the governing board. Some utilities must give the public a few weeks or months notice before increasing rates, or choose to do so by policy or practice. Some utilities require state approval to increase rates. Utilities that need state approval often have to file a rate case subject to public objection, and in some cases the state takes a long time to approve them or [denies the full rate increase](#).

The longer it takes a utility to implement a rate increase, the less flexibility it has to quickly generate new revenues when faced with cash flow shortfalls.

Subfactor 3b: Regulatory compliance and capital planning (10%)

The public utility sector is heavily regulated. Most public utilities are regulated by federal as well as state agencies.

The EPA enforces the Safe Drinking Water Act for water distribution utilities, the Clean Water Act for sanitary sewer and stormwater utilities, the Resource Conservation and Recovery Act for solid waste disposal systems, and the Clean Air Act for electric utilities. These statutes, and the methods employed to enforce them, are continually evolving, often intensifying over time. Additionally, many states have passed their own environmental regulations and are active enforcers.

This scorecard factor assesses utilities' compliance with relevant regulations and their plans for the capital expenditures required to comply in the future.

In addition to achieving environmental compliance, proper capital planning ensures the continued delivery of the product or service and the ongoing generation of revenues.

During our reviews, we look for indications of potential compliance gaps, such as environmental litigation, a delay in renewing a permit, or a [consent decree](#) with a state or federal enforcement body.

Below-the-line adjustments

Unusually strong or weak capital planning: Continued violations of environmental laws and the associated litigation can impose extraordinary costs on utilities. We may notch the score down if these costs threaten to overwhelm a system's resources, in the form of a large consent decree, lawsuit, or other costs. Alternately, we may notch the score up if a utility's capital planning is particularly sophisticated or forward-looking. More sophisticated and forward-looking capital management is more important for systems facing resource vulnerability or extreme weather volatility.

Factor 4: Legal provisions (10%)

Legal Provisions (10%)	Aaa	Aa	A	Baa	Ba	B and Below
Rate Covenant (5%)	> 1.30x	$\geq n$ 1.30x > 1.20x	$\geq n$ 1.20x > 1.10x	$\geq n$ 1.10x > 1.00x		$\leq 1.00x$
Debt Service Reserve Requirement (5%)	DSRF funded at MADS	DSRF funded at lesser of standard 3-prong test	DSRF funded at less than 3-prong test OR springing DSRF	NO explicit DSRF; OR funded with speculative grade surety		

Why it matters

The legal provisions of a public utility revenue bond form the backbone of its security.

When a municipality assigns its General Obligation pledge to a bond, it has promised to do whatever it has to do to cover debt service, in most cases from any revenues or resources at its disposal.

A utility revenue bond enjoys no such open-ended pledge, making the legal edifice of the bond critical to bondholder security. Most commonly, the legal security for municipal utility revenue bonds is a lien on the net revenues of the system. Occasionally, bondholders enjoy a lien on the gross revenues of a system. We ordinarily do not consider a gross revenue pledge as materially stronger than a net revenue pledge, because systems need to pay operating and maintenance costs in order to remain functional.

The linchpin of a bond's legal structure is its covenants: the legal compulsions the municipal utility agrees to when issuing the bonds.

Utilities abide by many different types of covenants. We consider three to be the most important: the rate covenant, the additional bonds test, and the debt service reserve fund. Also crucial in the analysis of a revenue bond's legal structure is whether the flow of funds is open-loop (accessible by another government entity) or closed.

Strong covenants bind the utility to utilize its assets to benefit bondholders by operating with a comfortable financial margin, not taking on too much debt, and maintaining adequate cash available to pay debt service. Weak or nonexistent covenants allow the utility to operate on a thin margin or even at a net loss, incur a lot of leverage, transfer its money to other government entities, or maintain inadequate cash, in ways that are detrimental to bondholders.

Covenants specify the minimum factors management must legally abide by. Utilities frequently exceed the minimum. Many of our ratings represent the expectation of performance at levels that exceed the covenants.

Subfactor 4a: Rate covenant (5%)

Input: Covenant governing net revenues (operating revenues minus operating expenditures net of depreciation) divided by annual debt service, expressed as a multiple

The rate covenant is a legal pledge to set rates such that net revenues will be sufficient to cover debt service at a prescribed level. For example, a covenant may bind a utility to ensure that net revenues

cover debt service by 1.2 times. If net revenues fall short of this covenant in one year, the utility must raise rates to achieve a compliant coverage level the following year.

The rate covenant takes many forms. Some utilities pledge for net revenues to cover current year annual debt service by a given level, others pledge to cover average annual debt service throughout the life of the bonds at that level. A strong coverage requirement would be for net revenues to cover maximum annual debt service (MADS) by a certain level.

Some rate covenant formats are materially weaker than this. Some utilities allow a “rolling” calculation, which includes outstanding cash from prior years’ surpluses as part of the resources available to cover debt service. Many rate covenants allow connection fees to be included in available operating revenues.

The above-the-line coverage factor assumes the covenant is an annual debt service coverage calculation. We can adjust for any departures from this format below the line, up or down.

Subfactor 4b: Debt service reserve requirement (5%)

Input: Debt service reserve requirement

Many issuers agree to hold a specified amount of cash or other resources in a debt service reserve fund (DSRF), which the trustee can tap to pay debt service in the event that net revenues are inadequate. The DSRF covenant ordinarily requires the utility to replenish any draws from the DSRF.

The DSRF protects bondholders by assuring the payment of debt service even if net revenues fall short in one year.

DSRF funds can be funded with cash, or with surety policies from an insurer. We generally consider cash to be superior to a surety, although this is unlikely to materially affect the rating as long as the surety provider is rated investment grade.

One commonly used DSRF requirement is known as the “three-pronged test.” Under tax law, the Internal Revenue Service limits the earning of interest on proceeds of a tax-exempt bond unless the invested proceeds comply with the three-pronged test. Under that test, the DSRF must be the lesser of 10% of principal, MADS, or 1.25 times average annual debt service. A DSRF set at the three-pronged test is usually weaker than one funded at MADS.

Recent years have seen a trend of revenue bonds issued without a DSRF. This has resulted in a number of utilities with some bonds secured by a DSRF and other parity bonds secured by the same lien but no DSRF. We have rarely distinguished ratings between these parity bonds. The DSRF is a last-resort security measure, and most utilities comply with their coverage covenants and never have to tap their DSRF. We are most likely to distinguish between DSRF-secured bonds and bonds with no DSRF if the system holds narrow liquidity. A system operating with abundant liquidity can use its operating cash to meet debt service shortfalls, effectively executing a similar function to the DSRF. The combination of narrow liquidity and no DSRF exposes bondholders to greater risks of interrupted debt service payments, and is therefore more likely to be reflected in ratings.

For a utility whose debt is mostly, but not all, secured by a DSRF, we will still enter the DSRF requirement into the scorecard. For a utility whose debt is mostly not secured by a DSRF, we will adjust the DSRF entry downward⁸.

Below-the-line adjustments

Coverage covenant other than annual debt service: Our input for the coverage covenant assumes the coverage refers to net revenue coverage of annual debt service. A “rolling” coverage covenant that includes outstanding cash, or some other modification that weakens the meaning of the covenant, may prompt us to notch the score down. Conversely, a MADS coverage covenant may prompt us to notch the score up.

Structural enhancements/complexities: The scorecard is designed to capture covenants as they are most commonly constituted, but cannot account for the myriad structures and complexities that arise in bond transactions throughout the sector. Enhancements such as a lock-box structure for debt service may lead us to notch the score up. Other shortcomings, such as a weak additional bonds test or the inclusion of cash in a coverage covenant, may lead us to notch the score down. Any characteristic of the legal provisions of a bond transaction may lead us to conclude that the scorecard does not adequately capture its risk profile.

⁸ For example, if 1/3 of a utility's debt is secured by a DSRF funded at MADs and 2/3 is not secured by a DSRF at all, we may enter the DSRF requirement as a Baa.

Moody's Treatment of Different Liens on a US Municipal Utility's Net Revenues

It is common for utilities to issue debt secured by different liens on their net revenues. Senior bonds are secured by a first lien on net revenues, and subordinate bonds or loans secured by a subordinate, or junior, lien. Sometimes, utilities will issue debt secured by a third lien or lower.

Our practice is to evaluate the likelihood of default and the expected recovery in the event of default for each lien independently.

This will most commonly result in a rating distinction of one notch for each lien of subordination. In other words, if a municipal utility's senior lien is rated Aa3, its subordinate lien will most likely be rated A1 and the third lien will most likely be rated A2.

The reason for the typical one-notch-per-lien distinction is that subordinate liens are marginally more likely to default than senior liens, and subordinate liens' expected recovery in the event of default would be lower. Senior liens are typically afforded stronger legal protections under utilities' indentures, senior-lien debt service is usually paid earlier in the flow of funds, and the first lien would likely enjoy a better claim in bankruptcy.

For most investment grade municipal utilities, the probability of default for any lien is small, and so the notching distinction is driven primarily by a greater expected loss severity in the unlikely event of a default. This is comparable to our approach for [ratings distinctions for different debt classes of investment grade corporations](#), where ratings distinctions are driven by differences in expected loss severities. In contrast to corporates, however, there often is not an explicit cross-default of senior municipal debt in the event of a subordinate payment default.

In some instances, we may conclude that an investment grade municipal utility's subordinate lien has a default probability and expected loss severity that is nearly as low or just as low as the senior lien (in which case we may not make a ratings distinction), or a default probability and expected loss severity that is materially higher than the senior lien (in which case we may make a ratings distinction of more than one notch).

Such a conclusion would be based on the municipal utility's management of its system with respect to its liens, and the characteristics of the legal framework governing the liens: rate covenants, additional debt provisions, and cross-default and acceleration provisions in a senior lien's variable rate debt resulting from a default on the subordinate lien, for example. If a utility has only a very small amount of senior lien debt, we may choose not to distinguish between liens.

The distinctions among a municipal utility's liens become more stark when it faces a material likelihood of default or bankruptcy. For these situations, the different characteristics of the liens are likely to drive greater disparities in default probabilities and expected recoveries for disparate liens. Thus, we are more likely to employ ratings distinctions other than one notch for speculative grade municipal utilities' different liens as the Loss Given Default approach drives more of the analysis.

In nearly all instances, the ratings on the different liens of the same utility will remain closely related. The reason for this is that municipal utilities are actively managed enterprises that continually need to generate net revenues sufficient not only to cover debt service but to fund capital needs. Even if senior lien coverage is strong, a utility that is unable to pay its junior lien debt service is not generating excess funds for capital investment and does not have capacity for capital borrowing. Thus, while subordinate liens face greater default probability and higher loss expectations based on their first-loss positions, an increased likelihood of default on a subordinate lien implies an increased likelihood of insolvency for the utility as a whole.

For this reason, we enter the debt-oriented inputs into the scorecard on a consolidated basis. For the debt to revenues factor, we enter total debt (senior and junior). For the debt service coverage factor, we enter total debt service coverage. It's the municipal utility's ability to cover all of its debt service with net revenues that determines its viability as a going concern. Even for a senior lien with a large coverage factor by net revenues, a narrow coverage of all debt service implies pressure to maintain healthy operations and generate funds sufficient for capital reinvestment.

Appendix A: Municipal Utility Revenue Bond Scorecard

EXHIBIT 10

		Aaa	Aa	A	Baa	Ba	B and Below
Numerical score		0.5 to 1.5	1.5 to 2.5	2.5 to 3.5	3.5 to 4.5	4.5 to 5.5	5.5 to 6.5
System Characteristics (30%)							
Asset Condition (10%)	Net Fixed Assets/Annual Depreciation :	> 75 years	75 years ≥ n > 25 years	25 years ≥ n > 12 years	12 years ≥ n > 9 years	9 Years ≥ n > 6 Years	≤ 6 Years
Service Area Wealth (12.5%)		> 150% of US median	150% ≥ US median > 90%	90% ≥ US median > 75%	75% ≥ US median > 50%	50% ≥ US median > 40%	≤ 40% of US median
System Size (7.5%)	Water and/or Sewer/ Solid Waste:	O&M > \$65M	\$65M ≥ O&M > \$30M	\$30M ≥ O&M > \$10M	\$10M ≥ O&M > \$3M	\$3M ≥ O&M > \$1M	O&M ≤ \$1M
	Stormwater:	O&M > \$30M	\$30M ≥ O&M > \$15M	\$15M ≥ O&M > \$8M	\$8M ≥ O&M > \$2M	\$2M ≥ O&M > \$750K	O&M ≤ \$750K
	Gas or Electric:	O&M > \$100M	\$100M ≥ O&M > \$50M	\$50M ≥ O&M > \$20M	\$20M ≥ O&M > \$8M	\$8M ≥ O&M > \$3M	O&M ≤ \$3M
Financial Strength (40%)							
Annual Debt Service Coverage (15%)		> 2.00x	2.00x ≥ n > 1.70x	1.70x ≥ n > 1.25x	1.25x ≥ n > 1.00x	1.00x ≥ n > 0.70x	≤ 0.70x
Days Cash on Hand (15%)		> 250 Days	250 Days ≥ n > 150 Days	150 Days ≥ n > 35 Days	35 Days ≥ n > 15 Days	15 Days ≥ n > 7 Days	≤ 7 Days
Debt to Operating Revenues (10%)		< 2.00x	2.00x < n ≤ 4.00x	4.00x < n ≤ 7.00x	7.00x < n ≤ 8.00x	8.00x < n ≤ 9.00x	≥ 9.00x
Management (20%)							
Rate Management (10%)		Excellent rate-setting record; no material political, practical, or regulatory limits on rate increases	Strong rate-setting record; little political, practical, or regulatory limits on rate increases	Average rate-setting record; some political, practical, or regulatory limits on rate increases	Adequate rate-setting record; political, practical, or regulatory impediments place material limits on rate increases	Below average rate-setting record; political, practical, or regulatory impediments place substantial limits on rate increases	Record of insufficiently adjusting rates; political, practical, or regulatory obstacles prevent implementation of necessary rate increases
Regulatory Compliance and Capital Planning (10%)		Fully compliant OR proactively addressing compliance issues; Maintains sophisticated and manageable Capital Improvement Plan that addresses more than a 10-year period	Actively addressing minor compliance issues; Maintains comprehensive and manageable 10-year Capital Improvement Plan	Moderate violations with adopted plan to address issues; Maintains manageable 5-year Capital Improvement Plan	Significant compliance violations with limited solutions adopted; Maintains single year Capital Improvement Plan	Not fully addressing compliance issues; Limited or weak capital planning	Not addressing compliance issues; No capital planning
Legal Provisions (10%)							
Rate Covenant (5%)		> 1.30x	1.30x ≥ n > 1.20x	1.20x ≥ n > 1.10x	1.10x ≥ n > 1.00x	≤ 1.00x ⁹	
Debt Service Reserve Requirement (5%)		DSRF funded at MADS	DSRF funded at lesser of standard 3-prong test	DSRF funded at less than 3-prong test OR springing DSRF	NO explicit DSRF; OR funded with speculative grade surety ¹⁰		

⁹ Scores as a Ba.¹⁰ Scores as a Baa.

Adjustments/Notching Factors

Factor 1: System Characteristics

Additional service area economic strength or diversity

Significant customer concentration

Revenue-per-Customer greatly over/under regional average

Exposure to weather volatility or extreme conditions

Resource vulnerability (1/3 or greater)

Sizable or insufficient capacity margin

Weak depreciation/reinvestment practices relative to industry norms

Other analyst adjustment to System Characteristics (Specify)

Factor 2: Financial Strength

Debt Service Coverage (Annual or MADS) below key thresholds: Additional Bonds Test and 1.00x coverage

Constrained liquidity position due to oversized transfers

Oversized capital needs

Oversized ANPL relative to debt or significant ARC under-payment

Significant exposure to puttable debt and/or swaps or other unusual debt structure

Other analyst adjustment to Financial Strength factor (Specify)

Factor 3: Legal Provisions

Structural Enhancements/Complexities

Other analyst adjustment to Legal Provisions factor (Specify)

Factor 4: Management

Unusually strong or weak operational or capital planning

Other analyst adjustment to Management factor (Specify)

Other

Credit Event/Trend not yet reflected in existing data set

Indicated Rating	Overall Weighted Score
Aaa	0.5 to 1.5
Aa1	1.5 to 1.83
Aa2	1.83 to 2.17
Aa3	2.17 to 2.5
A1	2.5 to 2.83
A2	2.83 to 3.17
A3	3.17 to 3.5
Baa1	3.5 to 3.83
Baa2	3.83 to 4.17
Baa3	4.17 to 4.5
Ba1	4.5 to 4.83
Ba2	4.83 to 5.17
Ba3	5.17 to 5.5
B1	5.5 to 5.83
B2	5.83 to 6.17
B3	6.17 to 6.5

Outlier Discussion

Out of approximately 1,080 municipal utilities rated under this methodology, there are eight significant outliers (defined as two broad rating categories, or six notches) when comparing the grid-indicated rating to the actual rating. Of these, seven are rated two broad categories higher than the grid-indicated rating and one is rated two broad categories lower. Most of these ratings have been placed under review at this time.

We expect outliers on single subfactors in our grid to appear frequently, as the grid is meant to capture a large and fragmented universe with many sectors and issuers with idiosyncratic properties. For most subfactors, we would not expect a single outlier score to play an outsize role in determining the rating. For certain subfactors (e.g., debt service coverage, cash on hand, and debt to revenues), single-factor outliers may represent significant credit pressure that could play a substantial role in determining the final rating. Indeed, 49 ratings have been placed under review at this time due to outlier scores on one or more of these factors.

The following are some comments on the frequency and effect of outliers in our subfactor scores:

Asset condition ratio

Approximately 2% of our rated municipal utilities score as outliers on this subfactor, with the majority of those scoring significantly lower than their actual rating. One factor that may skew this score is the use of disparate depreciation schedules, a practice we will address below the line. We would not expect single-factor outliers for this subfactor by itself to significantly drive ratings.

Size

Approximately 28% of our rated municipal utilities score as outliers on this subfactor, with nearly all of those scoring significantly lower than their actual rating. Although many utilities score as outliers on this subfactor, the subfactor scores lead to a generally close fit for grid-indicated ratings overall. We would not expect single-factor outliers for this subfactor by itself to significantly drive ratings.

Median family income

Approximately 2% of our rated municipal utilities score as outliers on this subfactor, with the majority of those scoring significantly lower than their actual rating. We would not expect single-factor outliers for this subfactor by itself to significantly drive ratings.

Coverage

Approximately 7% of our rated municipal utilities score as outliers on this subfactor, with the majority of those scoring significantly lower than their actual rating. This is one subfactor that we would expect to significantly drive ratings for single-factor outliers, to the downside. Consistently narrow debt service coverage represents a credit pressure that is unlikely to be fully offset by other positive factors.

Cash on hand

Approximately 5% of our rated municipal utilities score as outliers on this subfactor, with those roughly split between positive and negative outliers. This is another subfactor that we would expect to significantly drive ratings for single-factor outliers, to the downside. A narrow cash position represents credit pressure that may not be fully offset by other positive factors.

Debt to operating revenues

Approximately 6% of our rated municipal utilities score as outliers on this subfactor, with those roughly split between positive and negative outliers. This is the third subfactor that we would expect to significantly drive ratings for single-factor outliers, to the downside. An inordinately heavy debt burden may represent credit pressure that may not be fully offset by other positive factors.

Rate covenant

Approximately 7% of our rated municipal utilities score as outliers on this subfactor. Nearly all of these are utilities with either sum sufficient rate covenants or without rate covenants requiring sum sufficient coverage. In some cases, such as utilities with sum sufficient coverage covenants or weaker, this factor may significantly drive ratings.

Debt service reserve requirement

Approximately 9% of our rated municipal utilities score as outliers on this subfactor. Most of these are utilities without a debt service reserve requirement, or with a debt service reserve fund funded by a speculative grade surety. We would not expect single-factor outliers for this subfactor by itself to significantly drive ratings.

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U.S. Water and Sewer Revenue Bond Rating Criteria

Sector-Specific Criteria

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This report replaces the previous report of the same title dated July 31, 2013.

Scope

This report represents a sector-specific extension to Fitch Ratings' global criteria on "Revenue-Supported Rating Criteria," dated June 2014, and details Fitch's approach to rating U.S. municipal water and sewer (sanitary and stormwater) utilities. Municipal water and sewer utilities in the U.S. are enduring natural monopolies that provide highly essential services and generally have local rate-setting authority. These strong fundamentals generally have produced favorable financial margins and strong protections for bondholders. Fitch's average rating for these utilities is 'AA'.

This report elaborates on Fitch's review of specific factors known as the "10 Cs," which are a subset of the Revenue-Supported Rating Criteria's four areas: styled governance and management, financial profile, debt profile and operating profile. The 10 Cs include crew (an informal term for management); coverage and financial performance; cash and balance sheet considerations; charges and rate affordability; capital demands and debt burden; covenants; customer growth and concentration; capacity; compliance with environmental laws and regulations; and community characteristics.

Key Rating Drivers

Governance and Management: A utility's operating and fiscal health is highly dependent on the actions of the utility's employees and governing body. Consequently, Fitch performs a qualitative assessment of management, staff and policies to gauge likely ongoing operating stability.

Financial Profile: Fitch evaluates both historical and forecast financial results to determine the ability of a utility to fund operating and capital needs and meet its debt obligations. This component of the analysis is primarily quantitative in nature.

Debt Profile: Fitch analyzes the level and structure of a borrower's debt in determining overall creditworthiness. This area includes both quantitative and qualitative assessments relating to a utility's debt obligations.

Operating Profile: The ability of a utility to provide service to its customers and generate resources sufficient to meet its financial obligations is affected by a range of factors from the deployment of assets to the health of the service area. This component includes both quantitative and qualitative assessments of all aspects related to a utility's operations.

Related Criteria

[Revenue-Supported Rating Criteria \(June 2014\)](#)

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Overview

Fitch's approach to rating sector credits remains consistent with prior sector criteria publications. As the industry evolves or new market dynamics emerge, particular emphasis on certain aspects of the credit evaluation may arise. In addition, not all factors outlined in this report apply to each individual rating or rating action. Each specific rating action commentary or rating report discusses those factors most relevant to the individual rating decisions.

This report highlights particular aspects of Fitch's 10 Cs that typically serve as leading indicators in assigning a rating and provides the corresponding key quantitative ratios used in Fitch's analysis (see *Appendix A, page 12*), which are then compared with those of other peer systems. The attributes listed at the beginning of each section — along with the various identified ranges — generally detail expected characteristics for credits likely to be rated in the 'AA' rating category (that is, midrange attributes) as well as credits likely be rated above or below the average sector rating (that is, stronger and weaker attributes, respectively). As with Fitch's prior sector criteria, various frequently asked questions (FAQs) are discussed as they relate to specific points of the 10 Cs. In addition, certain best management practices are presented (see *Appendix B, page 13*). Finally, a list of basic information used by Fitch in the rating process is provided at the end of this report in Appendix C (see *page 14*) to assist market participants preparing for a rating review.

Governance and Management

Attributes: Governance and Management

Stronger	<ul style="list-style-type: none"> • Management and governing body with extensive experience in the utility sector. • An objective, engaged governing body that does not exert political pressure. • Transparency and strong communication between management and governing body. • In the case of wholesale systems, coordinated efforts among member utility systems and the governing body. • Frequent analysis of the accuracy of forecasts and resource management plans. • Well-developed and documented policies and procedures.
Midrange	<ul style="list-style-type: none"> • Generally stable management team and board of directors with modest turnover. • Resource management plans, forecasts of demand and management policies that generally reflect current economic, system and political conditions.
Weaker	<ul style="list-style-type: none"> • Lack of experience and depth at the utility. • Significant political pressure in the underlying municipality or in the members' service areas. • Failure to maintain open communications between the utility and the governing body, which may reveal itself in unexpected, significant rate increases. • Lack of forecasts and resource management plans. • Lack of policies and procedures.

Crew

Fitch's evaluation of management and management practices is qualitative in nature and includes a review of organizational policies and practices. Sound management practices are critical to a highly rated utility credit, affecting all aspects of Fitch's rating criteria. Throughout this report, numerous best management practices that affect credit quality are discussed and highlighted in addition to being summarized in Appendix B.

In general, the highest rated utilities exhibit multiple management practices that maximize expenditure stability by anticipating future regulatory and growth/supply demands, reliably implementing rate increases to cover operational and capital costs, and ensuring sufficient liquidity to cope with unexpected sales shortfalls or emergency needs. While elected officials play a necessary role in regulating the utilities' monopolies in their jurisdictions, the most stable utilities will generally operate relatively free from day-to-day political interference or

controversies concerning rate-setting policies. This is made easier by the long-term maintenance of financial management and planning practices, rate flexibility, manageable and well-planned capital programs, and segregation of enterprise fund finances from those of the general government. In assigning individual credit ratings, Fitch may specifically note favorable or unfavorable management practices that affect the ultimate rating assigned. However, if management practices are considered credit neutral, there may be no specific mention of this area within Fitch's public discussion of the credit.

Financial Profile

Coverage and Financial Performance

This area — including the various quantitative ratios used to evaluate an entity's revenues and expenditures — serves as a primary indicator in an entity's ultimate credit rating. These ratios are not only used to gauge current, historical and projected performance, but also compared with those of other peer systems.

Fitch typically rates only the senior lien debt of an issuer, as subordinate debt is more commonly privately placed with a state revolving fund and not rated. However, in the credit analysis, Fitch reviews not only an entity's senior lien debt service coverage, but also coverage on all debt supported by the utility. This provides a more complete assessment of an entity's ability to pay all its obligations (that is, operating and debt) and generate adequate financial margins.

In evaluating debt service coverage, Fitch takes into consideration all pledged revenues. However, Fitch also reviews coverage without growth-sensitive revenues, such as connection fees, given their variability. As part of its evaluation of debt service coverage,

FAQ: Does Fitch have a debt service coverage threshold to determine particular rating levels?

No, the debt service coverage itself does not determine where a utility falls on the rating scale. However, debt service coverage is one of Fitch's key ratios, so it does have a greater influence on the ultimate rating than non-key ratios.

Fitch also employs three standard stress scenarios to evaluate potential performance during periods of intense operating weakness such as prolonged drought, economic softness and/or a deceleration in customer usage. In general, the first scenario includes a precipitous drop in revenues that continues throughout the five-year forecast without corresponding cuts to expenses or increases in rates. The second includes a similar initial decline in revenues, followed by an immediate increase in user charges the following year to Fitch's affordability levels (see *Charges and Rate Affordability on page 5*), which typically would lead to an increase in revenues during the following years of the forecast. The third is a break-even scenario evaluating the level of revenue declines that may be sustained without cuts in expenditures. For the most part, these stress scenarios are used solely to inform the evaluation of debt service coverage and not predict future performance.

In addition to Fitch's standard stress scenarios, other stress analyses may be performed, as appropriate. For example, variable-rate debt service may be calculated at a higher interest rate in future years than assumed by the issuer if an issuer has an elevated level of variable-rate debt (generally greater than 20% of an issuer's debt profile) and/or any of the issuer's variable-rate bonds have been tendered, not remarketed, and purchased by the liquidity provider in accordance with the liquidity support agreement (that is, bank bonds). Another example of a stress scenario that may be utilized by Fitch is to assume a higher level of operating expenses than forecast by the issuer to account for potential budgetary pressures such as accelerating electricity, chemical or water purchase costs.

Other types of financial performance indicators evaluated by Fitch include growth in operating revenues and expenditures, operating margin, the level of transfers out made by the utility and the strength of the cash flows. Each of these ratios provides insight into the operations of the utility and serves to illuminate particular credit concerns. For example, growth in operating expenditures consistently outpacing that of operating revenues may signal that costs are not being adequately recovered in the rate structure. Also, cash flows consistently lower than the annual depreciation expense may signal that insufficient internal resources are being generated for renewal needs, which could lead to increased reliance on borrowable resources over time.

In general, Fitch views long-term financial planning as a credit positive, and this is perhaps more true for enterprise operations, for which long-range planning can clearly highlight future structural deficits necessitating revenue development, expenditure containment or both. Fitch believes utilities are more likely to be stable when such decisions are considered in advance, as a result of financial forecasting, rather than when they are made on a reactive basis, under pressure and with increased political controversy.

Numerous factors can cause financial volatility, including variations in water supply, weather-related demand and economic cycles. Consequently, highly rated utilities set goals for appropriate financial margins, including debt service coverage levels, debt affordability and reserve funding (such as rate stabilization, repair and rehabilitation, and operating reserves), and consistently establish rates and budgets that comply with their goals. Utilities operating in areas especially prone to rainfall volatility that consider the effect of such variability on their revenues and establish financial cushions to deal with potential weather events are considered stronger than those that do not consider such risks. Similarly, positive credit consideration is given when a utility incorporates its fixed annual system cash flow requirements within its financial goals. As part of monitoring financial performance relative to agency goals and policies, stronger utilities demonstrate regular financial reporting and accountability systems that report year-to-date financial performance to rate setters so midyear revenue and expenditure adjustments can be considered when needed.

Because the financial health of a utility depends on the receipt of revenues for services rendered, Fitch considers the development and maintenance of adequate billing and collection measures an imperative to investment-grade credit quality. Credit concerns exist for utilities that fail to meter customers or that do not replace aging meters in a timely fashion. Likewise, Fitch considers the existence of policies regarding the termination of service for unpaid accounts and a utility's practice of acting on those policies when necessary. In cases where accounts receivable (expressed as days of operating revenues) are significantly high in relation to a utility's billing cycle (for example, 2.0x or higher), negative credit implications would be expected.

Cash and Balance Sheet Considerations

Similar to coverage and financial performance, a utility's cash and balance sheet serve as key indicators of an entity's credit rating, and the resulting analysis is closely tied to quantitative ratios and the comparison of these ratios with those of other peer

FAQ: Are more stringent reserve policies considered a credit enhancement?

Not necessarily; a utility's credit rating is more likely to be enhanced by policies and targets that are achievable and adhered to by management, as opposed to those that are stronger but are either not likely to be reached or would adversely affect other credit fundamentals if maintained.

utilities. For the most part, these ratios are designed to measure a utility's available liquid resources to meet near-term liabilities, particularly in the event of unforeseen hardships or

difficult operating conditions. Because of the nature of these calculations, Fitch considers liquid resources to be current unrestricted assets, although credit may be given to noncurrent or restricted assets if they are available for general purposes at the discretion of the governing body (for example, a restricted operating reserve fund) and if Fitch is aware of such resources.

The key ratios Fitch uses in determining an entity's liquidity are days cash and days of working capital, which compare available resources with operating expenses. However, other measurements are also used, including quick and current ratios, to gauge a utility's ability to meet near-term liabilities. Fitch also considers an entity's cash position relative to swap termination events to gauge the hardship such an event might pose to continued operating performance.

Charges and Rate Affordability

Fitch's analysis in this area is a mixture of qualitative and quantitative factors. While this area typically does not have a significant impact on the rating outcome, Fitch's perception of high utility rates, lack of future rate flexibility, volatility in the revenue structure or difficulty in obtaining timely rate relief may have a direct bearing on the entity's rating level.

With this in mind, utilities should consider the impact of operational and capital programs on rate affordability. While Fitch believes credit is due to those systems that consistently raise rates to preserve financial strength, these activities will be more sustainable when rate affordability is a focus of policymakers and cost containment is

regularly employed. Fitch believes that not only should the level of rates for particular customers be considered in these reviews, but also the affordability of rates relative to income, particularly for residences, which tend to generate the most user charge revenues of retail systems. In this regard, Fitch generally considers rates for service higher than 1% of MHI for an individual water, sewer and stormwater utility to be financially burdensome.

Another measure Fitch may consider when evaluating utility rates is the cost of service from other comparable utilities in the region. The comparison is utilized to determine whether future growth may be hampered due to the lack of competitiveness, particularly in neighboring suburban communities that have similar economic and residential bases. The comparison is also useful in that anticipated rate increases may be projected forward to determine continued competitiveness. Finally, a regional comparison may act as a counterbalance to the 1% threshold where rates overall are above average but well within local affordability levels or, conversely, low to moderate overall but at or near 1% of MHI.

In evaluating user charges, Fitch considers how a utility generates its revenues. Most utilities bill customers based on a fixed amount (that is, a readiness-to-serve charge) and a volumetric rate relative to actual usage. Because systems with greater percentages of fixed charges have less volatility in their revenue streams than systems that rely extensively or completely on volumetric charges, utilities whose fixed-charge components generate a significant amount (greater than 30%) of their revenue streams are considered stronger.

FAQ: Are utilities with lower service rates deemed more creditworthy?

No, Fitch's review of service rates and charges focuses on rate flexibility, which not only incorporates existing low rates but also considers a utility's ability to control costs and raise rates in a timely manner without political impediment. Rates as a percentage of median household income (MHI) alone do not provide a complete assessment of rate flexibility.

Attributes: Financial Profile

Stronger	<ul style="list-style-type: none"> • Total debt service coverage of approximately 2.0x or greater. • Days cash and days of working capital equal to one year or more. • Free cash relative to depreciation equal to 100% or greater. • Residential charges for individual or combined water/sewer utilities less than or equal to 0.6% or 1.2% of MHI, respectively. • A significant percentage of revenues recovered through base charges as opposed to volumetric charges.
Midrange	<ul style="list-style-type: none"> • Total debt service coverage of approximately 1.5x. • Days cash and days of working capital of about six months. • Free cash relative to depreciation equal to approximately 85%. • Residential charges for individual or combined water/sewer utilities of about 0.8% or 1.5% of MHI, respectively. • Approximately 10% of revenues recovered through base charges.
Weaker	<ul style="list-style-type: none"> • Total debt service coverage of approximately 1.25x or less. • Days cash and days of working capital of three months or less. • Free cash relative to depreciation of 60% or less. • Residential charges for individual or combined water/sewer utilities in excess of 1.0% or 2.0% of MHI, respectively. • Little or no revenues recovered through base charges.

Fitch also incorporates the rate approval process and general relationship with the utility's rate-making body into its rating analysis. As mentioned, a major credit strength of municipal utilities is the local control over rate setting, free from external oversight. Still, local authorities can be subject to other community interests or political pressures. A lengthy rate review process, which can hinder timely cost recovery, or a demonstrated reluctance by governing officials to adjust rates in line with increasing costs can negatively affect the rating.

Debt Profile

Capital Demands and Debt Burden

Utilities are capital intensive, with debt service burdens that often surpass those of general governments as measured by the percentage of revenues. Because of the pressure capital and debt activities can have on a utility's operating and financial profiles, the analysis related to this area also serves as a key indicator of an entity's credit rating. Quantitative ratios are an overarching consideration, with such ratios compared with those of other utilities to help gauge relative capital needs and debt burden.

FAQ: How does Fitch view an amortization rate of 30 years or longer, even for projects with a life cycle exceeding this term?

While highly rated utilities typically amortize debt with terms under 30 years, the pace of debt retirement is only one of several factors in Fitch's rating criteria. However, amortization is an important credit metric used by Fitch because it acts as a gauge to measure how much future strain will be put on a utility's financial flexibility and borrowing capacity for potential capital needs.

In general, utilities limiting debt exposure by utilizing annual pay-as-you-go funding, including excess user charges and growth-related fees, for a significant portion of their capital programs are considered stronger than those relying predominantly on debt. Elevated debt issuance over the near term may not adversely affect credit quality, although, in assigning a credit rating, Fitch considers anticipated debt issuance in light of outstanding obligations, affordability levels and historical financial performance, as well as the need for financing such projects.

Key ratios used in evaluating an entity's debt burden include the measurement of outstanding debt on both a customer and per capita basis, as well as expected customer and per capita debt levels five years into the future; for wholesale systems, the measurement generally is limited to just debt per capita. Other quantitative ratios typically considered include the expected level of annual capital spending per customer through the capital improvement program (CIP) cycle, the percentage of

debt funding relative to total CIP costs, and debt relative to equity and net plant assets. In addition, to gauge a utility's capacity for future debt issuances over the long term, Fitch evaluates the amortization rate of all debt payable from system revenues.

For debt funding of capital requirements, long-term fixed-rate debt historically has been the norm for water, sewer and stormwater utilities, with terms ranging from 20–30 years. However, borrowers have utilized variable-rate instruments as well to reduce borrowing costs. In some instances, borrowers have also entered into swap agreements as a hedge to variable-rate obligations or to take advantage of spreads between fixed-rate debt and a swap index.

Fitch recognizes the potential benefits of both variable-rate obligations and swap agreements to borrowers and believes that both types of instruments can be important tools in a utility's overall debt strategy. Nevertheless, Fitch believes it is imperative that management understand the implications of variable-rate and swap strategies prior to engaging in them, thoroughly evaluating the potential risks and benefits of such instruments within the utility's asset/liability plans. Utilities with a perceived high degree of exposure (for example, a significant proportion of variable-rate debt and/or swaps relative to all outstanding debt or a high exposure of credit facilities with a single institution) and/or a perceived lack of understanding and ability to manage such exposure will face tighter scrutiny than those with little or no variable-rate obligations or swap agreements outstanding.

In evaluating variable-rate and swap exposure, Fitch employs both qualitative and quantitative factors to assist in gauging relative risk associated with these instruments. Qualitative factors include items such as an evaluation of lien payment of regular and termination payments, collateral posting requirements and cross-default provisions. Quantitative factors generally include the amount of hedged and unhedged variable-rate debt and the ability to meet termination payments from unrestricted reserves.

Regulations, customer growth and capacity constraints are all major determinants of a utility's capital improvement burden. Integration of these diverse considerations into a comprehensive multiyear CIP and asset management strategy is generally a trait of highly rated utilities. CIPs that attempt to prioritize expansion, improvement, and operating and maintenance needs and determine their financial impacts for rate-setting officials are considered a credit positive. This can facilitate informed long-term decision making of funding and construction alternatives, minimizing political and consumer rate shock in some cases, if additional revenues are required.

Covenants

Covenants promote a certain level of credit stability for investors. If included, they can provide a degree of protection against downgrades of sector revenue bonds. Fitch performs a qualitative assessment in this area and views

standard bond covenants for retail utilities and most wholesale providers as those that limit parity bond issuance to instances when historical and/or projected revenues cover annual debt service (ADS) at least 1.2x; require 1.2x rate setting annually to cover both operations and debt service costs; and create debt service reserve funds (DSRFs) at the maximum levels allowed under tax law. Additional covenants requiring set-asides for operational, maintenance and other financial reserves are positive credit features, as they heighten prospects for stable financial management.

In nearly all cases, Fitch will consider financial performance on a net revenue basis even if a gross revenue debt security pledge is present, as creditworthy systems must reliably cover

FAQ: How does Fitch view modifications to standard legal covenants?

A utility credit rating is less likely to move upward due to a marginal enhancement to standard covenants than it is to move downward as a result of the same degree of change toward relaxing these covenants.

operating expenditures from the same revenue streams used to pay debt service. However, most retail and wholesale utilities comfortably exceed their covenant coverage and liquidity requirements and should continue to do so. For them, the focus of a rating review should be actual and likely future performance, not minimum covenanted performance in a stress scenario.

A trend in the sector toward relaxed covenants continues. Changes proposed typically focus on reducing coverage requirements or reserve fund levels. The particular rating impact of relaxed covenants will depend on the system, its characteristics and the specific proposed changes. In cases where a change in covenants has not adversely affected a rating, such utilities have demonstrated strong and consistent performance well above existing requirements, and such change is not expected to weaken the credit quality of the utility in the foreseeable future.

Covenants will be an increasingly greater credit factor for lower rated credits and in cases of declining credit quality. Consequently, any loosening or modernization of such covenants may be expected to have a negative impact on the credit rating in these instances.

As for relaxation of the rate covenant in particular, Fitch views 1.0x coverage of ADS from ongoing net revenues, excluding one-time sources such as connection fees, as a minimum threshold. Utilities not producing 1.0x ADS from ongoing net revenues — even utilities that substantially exceed a higher rate covenant requirement from all pledged sources — have a greater likelihood of receiving a lower credit rating than a comparable system that is able to meet this level of coverage.

Other legal covenants that have been modified (and weakened from a bondholder's perspective) include the elimination of DSRFs and satisfaction of these DSRF requirements with surety policies, along with the ability to enter into swaps or other forms of hedge agreements. To date, there has been little impact on utility credit ratings from these changes, and any future downward pressure on individual credits will likely be isolated. However, instances that may affect the credit rating of a utility include cases where there is a reasonable chance revenues available to pay debt service are below 1.0x and no DSRF exists or a surety policy is in place; a large swap termination payment(s) exists, which would have a material impact on an entity's financial capacity if required to be paid; or it is likely that rated obligations could be affected by cross-default provisions of a hedge agreement.

Attributes: Debt Profile

Stronger	<ul style="list-style-type: none"> Existing and five-year projected debt per customer of \$1,500 or less. Existing and five-year projected debt per capita levels of \$500 or less. Debt funding of capital of 50% or less. Amortization of principal equal to 90% or greater over the ensuing 20 years. Rate covenant of more than 1.25x coverage of ADS by net revenues. Additional bonds test of more than 1.25x coverage of maximum ADS by historical net revenues. Debt service reserve funded with cash and at the maximum allowable by law.
Midrange	<ul style="list-style-type: none"> Existing and five-year projected debt per customer of approximately \$1,800. Existing and five-year projected debt per capita of about \$550. Debt funding of capital of about 75%. Amortization of principal of approximately 80% over the ensuing 20 years. Rate covenant of 1.15x–1.20x coverage of ADS by net revenues. Additional bonds test of 1.15x–1.20x coverage of ADS by historical or projected net revenues. Debt service reserve funded from cash or surety policies at the maximum allowable by law.
Weaker	<ul style="list-style-type: none"> Existing and five-year projected debt per customer of \$2,100 or greater. Existing and five-year projected debt per capita of approximately \$600 or greater. Debt funding of capital of about 90% or more. Amortization of principal of about 70% or less over the ensuing 20 years. Rate covenant of 1.10x or less of ADS by net revenues. Additional bonds test of 1.10x coverage or less of ADS by historical or projected net revenues. No debt service reserve.

Operating Profile

Customer Growth and Concentration

A central component of a utility's operating profile is the level of growth of a utility's residential, commercial, industrial and government customer bases, as well as the utility's customer concentration. In terms of growth, demonstrated steady increases are considered positive from a credit perspective, given projecting financial results and planning for needed improvements or expansions are generally easier in such stable environments. Conversely, high growth and declining customer bases are more likely to affect a rating negatively, as they can pressure the financial and capital decisions of a utility. Fitch considers annual growth rates above 3% to be rapid, whereas rates of 1% and under are viewed as stable; annual growth rates between 1% and 3% are seen as moderate.

A high-growth environment poses special challenges for utilities, particularly in terms of the timing and funding of capital improvements. As a community expands, water and wastewater infrastructure must often be built in advance of growth and/or additional water supplies or treatment capacity must be developed. Potential vulnerabilities include instances when growth does not occur as fast as anticipated. In such cases, user charges will likely be raised for existing customers to cover debt and operating costs. Not only can this provoke political and rate pressure for the utility, potentially resulting in strained financial margins, but it can also reduce the community's attractiveness to new residents and businesses, compounding the growth challenge.

While these growth challenges pose credit concerns, management can offset potential risks through well-developed capital and financial plans and policies that identify the nature and timing of future capital and operational needs. In high-growth locales in

particular, Fitch views positively a requirement that developers fund capital expansion components up front, including procurement of additional water rights to serve a proposed development. Fitch also evaluates whether rate structures for utilities include impact fees that are sized to recover a meaningful proportion of the capital costs required to serve the growth. Fitch generally views these impact fees as a positive credit feature of the rate structure, although dependence on these fees for ADS payments is a risk. Higher rated utilities should also demonstrate modular capital expansion plans, which can be accelerated or slowed based on actual demand trends.

On the other end of the spectrum, Fitch's credit analysis will consider the pressure associated with a declining customer base. Utilities with long-term planning practices in place may find savings through cost or personnel reduction and rely less on underused assets, when possible. The credit benefits of these management practices will be more pronounced when they are institutionally implemented on an ongoing basis, preparing for future challenges instead of responding to such demands in a reactive way.

While planning may limit certain exposures of a declining service base, customer concentration, which may ultimately lead to the loss of significant revenues with the departure of a single customer or downturn in a particular industry, is considered a negative characteristic in the analysis. To this end, Fitch evaluates concentration levels in light of a service area's economic focus and sector concentration among the users. Volatility in the service base can be most severe when the largest customers, particularly industrial entities, exit a community or substantially downsize operations. In

FAQ: Do ratings reflect a utility's population size?

No, Fitch does not consider size to be a key rating factor. Some of Fitch's highest credit ratings are small and midsized utilities with substantial capacity, strong financial margins, low rates and considerable rate flexibility, and limited capital needs.

such a case, a utility not only would face pressures from the loss of revenues of such large users, but also may be constrained to increase rates because of elevated unemployment among its residential customers. In general, Fitch views revenue concentration from the top 10 customers in excess of 20% as high. Fitch also considers concentration in excess of 5% from any individual customer as high.

Capacity

Capital development and asset management strategies that consider capacity at every stage of the utility's service delivery process — supply sources, treatment facilities, collection, transmission and distribution, as well as management, technological and personnel capacity to deal with anticipated service demands — are viewed as a credit positive. Fitch believes that cooperative service management efforts with local land

use and growth planning can be especially helpful in this regard. Such interactions can produce more accurate estimates of expected aggregate service area expansion and determine where and when such growth may occur. With these facts, managers can make better informed decisions on where, when, how and in what priority service capacity should be expanded, maintained or reduced.

Fitch's rating criteria take into account comprehensive plans to maintain existing facilities and replace aging or obsolete assets. Consequently, Fitch views trends of deferred maintenance as a credit risk. In this regard, Fitch quantitatively evaluates a utility's annual depreciation in relation to its total historical depreciation of fixed assets to determine the age of plant. Fitch also compares a utility's annual capital expenditures in relation to depreciation for the year to gauge the amount of ongoing maintenance being performed. Utilities with aging infrastructure or annual capital spending that regularly falls below the amount of annual depreciated assets may require substantial upgrades in the near term to maintain regulatory compliance. Another quantitative indicator of potential needs, as far as water utilities are concerned, is the amount of treated but unbilled water distributed. Water utilities regularly replacing aging pipelines should experience unbilled water rates at or below the 10%–12% typically seen within the industry.

The availability of adequate water supplies is critical for a utility to meet its customer demands. As such, Fitch expects highly rated water utilities will carefully consider their water supply source capacity on an ongoing basis as part of their capital and financial planning processes, allowing for not only their demands on such sources, but also those of neighboring jurisdictions. Credit quality is enhanced for utilities that demonstrate a sustainable long-term supply to meet current and expected future growth needs. Alternatively, negative credit implications arise for utilities whose resources may be insufficient to allow for continued economic development.

Compliance with Environmental Laws and Regulations

Mandates have been a dominant factor for sector credits since passage of the federal Clean Water Act in 1972 (amended in 1977, 1981, 1987 and 2014) and federal Safe Drinking Water Act in 1974 (amended in 1986 and 1996). Although regulatory requirements continue to

FAQ: Can changes in weather patterns affect a bond rating?

In general, Fitch acknowledges the sector is affected by variability in weather patterns, which can lead to changes in a utility's financial performance from year to year. Some fluctuation in annual financial performance alone is not likely to result in a rating change. However, a prolonged lack of action by management to contend with effects on the long-term financial profile, resulting in deterioration of credit fundamentals, could have a negative impact on the rating. The degree to which a utility is prepared to handle these challenges is a reflection of managerial expertise, overall financial flexibility, the rate structure and rate flexibility.

pressure some enterprises, utilities can reduce credit risk by consistently attempting to predict and stay ahead of expected requirements at both the state and federal level given this typically provides more flexibility to utilities than acting while under the threat of orders and fines from regulatory bodies or the courts.

For utilities facing regulatory enforcement, Fitch qualitatively evaluates in the rating process the events leading to enforcement, scope of the corrective plan, current stage of the corrective plan and projected timeline for completion. Fitch also focuses on the expected quantitative impact on ratepayers and management's commitment to meeting the set milestones and returning to compliance.

FAQ: Does regulatory enforcement preclude a utility from a high credit rating or dictate immediate rating action?

No. However, enforcement actions may reflect underlying credit weaknesses that extend beyond actual violations (for example, management issues), in which case the rating could be directly affected. Fitch observes this is most likely to occur in instances of political unwillingness to raise rates to address needed capital improvements or because of a lack of planning to identify and address shortcomings within the system. In such cases, enforcement action likely would put increased downward pressure on a rating, as opposed to being the explicit cause of a rating downgrade.

Community Characteristics

The service area economy and customer base characteristics are part of the rating analysis, since the essentiality of the enterprises' services provides localities with a de facto ability to tax for their provisions. Quantitative factors related to the analysis of this particular area typically include employment/unemployment statistics, wealth levels, poverty rates and an evaluation of major employers relative to the total employment base.

FAQ: Are revenue bond ratings capped by the general obligation (GO) rating of the service area?

No, Fitch's revenue bond ratings are not notched from the service area's GO bond rating, and the GO ratings are not considered a cap. In fact, in some cases, Fitch rates an entity's utility revenue bonds higher than its GOs.

The highest rated utilities typically reflect service areas with broad economies and broad and diverse customer bases, since they are less vulnerable to sectoral downturns and cyclical economic shifts. Utilities operating in service areas with prospects for significant future population, commercial and industrial volatility or long-term decline are more likely to have lower bond ratings.

Attributes: Operating Profile

Stronger	<ul style="list-style-type: none"> • Customer accounts stable or growing less than 1% annually. • Top 10 customers for retail utilities represent 5% or less of system revenues and no customer accounts for more than 2% of system revenues. • Treatment capacity in excess of 140% of demand or flows. • Annual renewal of 100% or more of depreciated assets. • Unbilled/unaccounted for water of less than 10%. • Full compliance with regulatory requirements.
Midrange	<ul style="list-style-type: none"> • Customer account growth of 1%–3% annually. • Top 10 customers for retail utilities represent approximately 10% of system revenues and no customer accounts for more than 5% of system revenues. • Treatment capacity of about 130% of demand or flows. • Some deferred maintenance. • Unbilled/unaccounted for water of about 12%. • Limited noncompliance with regulatory requirements.
Weaker	<ul style="list-style-type: none"> • Customer account growth in excess of 3% annually. • Top 10 customers for retail utilities represent over 20% of system revenues and/or individual customer concentration accounts for 10% or more of system revenues. • Treatment capacity falls below 120% of demand or flows. • Significant deferred maintenance. • Unbilled/unaccounted for water exceeds 15%. • Material noncompliance with regulatory requirements, resulting in significant capital expenses and/or fines.

Appendix A: Key Ratios Used in the “10 Cs” Rating Process

Ratio	Definition	Significance
Total Outstanding Long-Term Debt per Customer (\$)	Total amount of utility long-term debt divided by the number of utility customers (for a combined utility, the aggregate number of water and sewer accounts is used)	Indicates the existing debt burden attributable to ratepayers (principal only)
Projected Debt per Customer Year Five (\$)	Total projected outstanding system debt (existing debt less scheduled amortization plus planned issuances) divided by total outstanding projected customers five years from the date of the rating (for a combined utility, the aggregate number of water and sewer accounts is used and is inflated by anticipated growth)	Indicates the total debt burden to ratepayers five years from the date of the rating (principal only)
Total Outstanding Long-Term Debt per Capita (\$)	Total amount of utility long-term debt divided by total population served by the utility	Indicates the existing debt burden of a utility attributable to each person served by the utility (principal only)
Projected Debt per Capita Year Five (\$)	Total projected outstanding system debt (existing debt less scheduled amortization plus planned issuances) divided by total projected population served by the utility (population is inflated based on anticipated growth)	Indicates the total debt burden of a utility to each person served by the utility five years from the date of the rating (principal only)
Three-Year Historical Average Senior Lien Annual Debt Service (ADS) Coverage (x)	Most recent three-year historical average of annual revenues available for debt service divided by respective senior lien debt service for the year	Indicates the historical trend in senior lien ADS coverage
Senior Lien ADS Coverage (x)	Current-year revenues available for debt service divided by current-year senior lien debt service	Indicates the financial margin to meet current senior lien ADS with current revenues available for debt service
Minimum Projected Senior Lien ADS Coverage (x)	Minimum debt service coverage projected typically over the ensuing five-year period, based on revenues available for debt service in any given fiscal year, divided by the respective senior lien debt service amount for that fiscal year	Indicates the financial margin during the year in which future senior lien ADS coverage is projected to be the lowest
Three-Year Historical Average All-In ADS Coverage (x)	Most recent three-year historical average of annual revenues available for debt service divided by respective total debt service for the year	Indicates the historical trend in total ADS coverage
All-In ADS Coverage (x)	Current-year revenues available for debt service divided by current-year total debt service	Indicates the financial margin to meet current total ADS with current revenues available for debt service
Minimum Projected All-In ADS Coverage (x)	Minimum debt service coverage projected typically over the ensuing five-year period, based on revenues available for debt service in any given fiscal year, divided by the respective total debt service amount for that fiscal year	Indicates the financial margin during the year in which future total ADS coverage is projected to be the lowest
Days Cash on Hand	Current unrestricted cash and investments plus any restricted cash and investments (if available for general system purposes), divided by operating expenditures minus depreciation, divided by 365	Indicates financial flexibility to pay near-term obligations
Days of Working Capital	Current unrestricted assets plus any restricted cash and investments (if available for general system purposes) minus current liabilities payable from unrestricted assets, divided by operating expenditures minus depreciation, divided by 365	Indicates financial flexibility to pay near-term obligations
Free Cash as % of Depreciation	Current surplus revenues after payment of operating expenses, debt service and operating transfers out divided by current-year depreciation	Indicates annual financial capacity to maintain facilities at current level of service from existing cash flows

Appendix B: Water and Sewer Best Management Practices

Financial Profile Related

- Long-term integrated financial forecasting that considers future demand, expected rate increases, regulations, and infrastructure renovation and renewal needs.
- Policies to ensure appropriate financial margins, including debt service coverage and operating liquidity levels. Utilities with variable-rate debt and swap agreements are expected to understand the implications and potential risks of such capital management strategies. In addition, these utilities should include management's rationale for the sizing of financial reserves and the adequacy of those reserves to cope with interest rate fluctuations and possible termination payments.
- Regular financial reporting and monitoring systems that enable policymakers access to timely information on fiscal performance relative to the budget.
- Limited operating exposure to growth-sensitive revenues, such as tap, connection or impact fees.
- Collection policies that regularly track the rate of timely payment receipts and enforce penalties against late payers or terminate service for nonpayment.
- Willingness of governing board to adjust rates when necessary.
- Limited exposure to financial operations of the general government, so that system revenues can be relied on for use to operate and improve the utility. For transfers to the general fund, policies that specifically limit their scope and growth are favorable.
- Compliance with industry accounting practices and establishment of appropriate internal controls.
- Rate affordability guidelines that consider absolute levels of rates and their affordability relative to income levels.

Debt Profile Related

- Prioritized capital improvement plans that cover at least five years and consider capacity, supply, regulatory, and replacement and renewal needs.
- Debt issuance policies, including types, terms and suitability under specific conditions, as well as the total amount of variable-rate debt deemed appropriate.
- Development of comprehensive policies on the use of hedge agreements and their disclosure prior to entering into any such agreements.

Operating Profile Related

- Key management industry experience and active participation in organizations to keep pace with sector issues, regulatory mandates and technological advances.
- Use of professional engineers, either within the utility or outside of it, to prepare objective reviews of system performance and needs on a regular basis and provide periodic revisions of construction cost estimates.
- Regular consultation with regional and local growth planners, community development officials and demographers to predict and, if possible, limit infrastructure needs related to population and business growth.

Appendix C: Checklist of Basic Documents for the Rating Review Process

- Legal documents related to the debt being rated.
 - Five years of audited financial statements.
 - Current budget.
 - Detailed five-year capital improvement plan (CIP), including sources of funding by year.
 - Minimum five-year financial forecast inclusive of implementation of the CIP-related debt issuance and operations; this forecast should include detailed assumptions used, including service rate adjustments, nonrecurring revenue sources and timing of debt issuances.
 - List of current debt outstanding segregated by lien, including the principal maturity schedule, total annual debt service requirements for each lien and expected annual federal interest subsidies for each lien; this information should include all obligations outstanding that are supported by system revenues.
 - Information related to all outstanding hedge agreements, including terms, notional amortization, lien pledge of regular and termination payments, bond events, and bond cures, including collateral posting requirements; a recent fair market value for each swap should also be provided.
 - Discussion of longer term capital needs beyond the five-year horizon.
 - Formal policies and disclosure of targets for annual financial performance and transfers to the general fund, as well as other formal policies, including those related to investments, cash funding of the CIP, and maintenance of repair/replacement, rate stabilization, and other reserve funds.
 - Five-year history of average annual number of customers, average daily water demand, peak water demand, unbilled water, average sewer flows and peak sewer flows. Wholesale service providers, whether full or partial, should also provide an estimate of single-family equivalent units.
 - List of top 10 customers in terms of both annual sales and revenue.
 - Description of system facilities, including treatment and storage capacity.
 - Description of water sources, any purchased water contract terms and priority of water rights; discussion of potential new supplies, if applicable.
 - Integrated resource plan, if available.
 - Disclosure of compliance or regulatory issues, if any; required remedies and major milestones; and costs.
 - Policies on reviewing and setting rates, current rate schedule, historical rate changes for at least five years and proposed future rate schedule (planned or adopted).
 - Current rate comparisons with other area providers.
 - Description of billing procedures, level of delinquencies and bad debts, and available recourse options for customer nonpayment.
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